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Technical Report Overview

Report: Study of the Reproductive Effects of Selenium on Redside Shiner 2019

Overview: This report presents the summary of work undertaken in 2019 on a reproductive toxicity study of redside shiner from the Elk Valley. This report includes results from the three-year monitoring program (2014 to 2016) specific to selenium concentrations in redside shiner ovaries in the Koochanusa Reservoir.

This report was prepared for Teck by Golder Associates Ltd. In association with Minnow Environmental Inc. and Nautilus Environmental Company Inc.

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



REPORT

**Study of the Reproductive Effects of Selenium on
Redside Shiner (*Richardsonius balteatus*)
2019**

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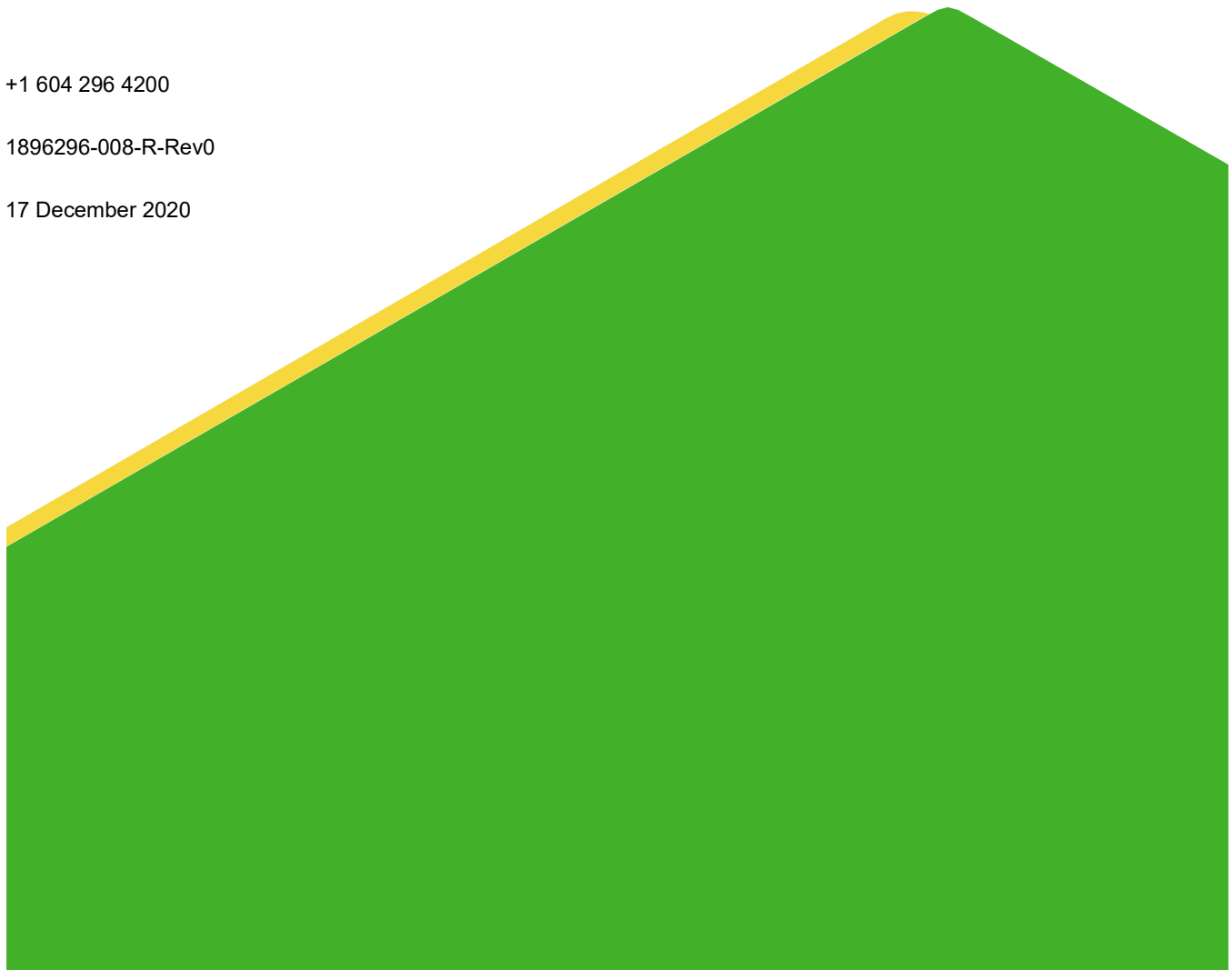
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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) in association with Minnow Environmental Inc. (Minnow) and Nautilus Environmental Company Inc. (Nautilus) are pleased to provide Teck Coal Limited (Teck) with the following summary of work undertaken in 2019 on a reproductive toxicity study for reidside shiner (RSC, *Richardsonius balteatus*) from the Elk Valley, BC. The objective of this study was to characterize effects of maternally transferred selenium on early life stage development of RSC.

The study described herein was developed in response to findings of a three-year monitoring program (2014 to 2016) conducted in Koochanusa Reservoir to characterize and compare chemical and biological conditions in the reservoir downstream from the Elk River compared to upstream (Minnow 2018a). The monitoring program reported that selenium concentrations in RSC ovaries were greater than the British Columbia guideline (11 mg/kg dry weight [dw]), the United States Environmental Protection Agency (US EPA) selenium criterion (15.1 mg/kg dw), and the Elk Valley Water Quality Plan level 1 benchmark (18 mg/kg dw) (Teck 2014). Implications of these ovary selenium concentrations for RSC reproduction are uncertain because no toxicity data exist for this species.

RSC is a western minnow found throughout British Columbia and in the northwestern United States west of the Rocky Mountains. They occur in schools of thousands in large lakes, ponds, and moderately fast-moving streams, tolerating a wide variety of temperatures and trophic conditions. In lakes, smaller individuals tend to remain in the upper water column and/or close to shore. Other than during spawning migration, RSC exhibit very little directed movement aside from movements on and off shoals in lake environments related to changes in water temperature (Scott and Crossman 1998). RSC spawn in the early spring in groups of 30 to 40 fish, both in streams and in lakes when water temperatures reach approximately 10°C and show a strong affinity for natal spawning grounds (Scott and Crossman 1998). Eggs tend to hatch 3 to 15 days post-spawning, depending on water temperature. RSC usually reach sexual maturity by their third year. RSC fry feed mainly on plankton and demersal crustaceans, while larger fish are mainly insectivorous but feed on fish eggs opportunistically (Scott and Crossman 1998).

A pilot study was conducted in 2018 in an attempt to identify an effect level for selenium in RSC. The pilot study involved collection of adult RSC from a reference area (Loon Lake), an area with moderate exposure to selenium (Elk River Oxbow), and an area with relatively high exposure to selenium (Goddard Marsh). Fish were transported to a laboratory facility at Simon Fraser University (SFU), where temperature and photoperiod were manipulated in an attempt to stimulate gonadal development. These manipulations were unsuccessful, and despite multiple injections of Ovaprim, the fish did not develop further at the laboratory (Golder et al. 2018). These fish were held through the winter of 2018-2019 at SFU and fed a range of dietary selenium concentrations (control, ~10 mg/kg dw, ~20 mg/kg dw, and ~30 mg/kg dw selenium in *Lumbriculus* worms fed selenium-enriched yeast) in preparation for a repeated attempt to stimulate spawning in the spring of 2019.

In parallel with the repeated attempt to stimulate spawning in laboratory-held fish, Teck undertook the 2019 field study to reduce uncertainty in the sensitivity of RSC to selenium. Minnow was responsible for field study components and Nautilus was responsible for laboratory study components and supported the field program by fertilizing field-collected eggs. Golder was responsible for leading development of the study design, project management, data interpretation, and reporting. All parties contributed to the content of this report.

2.0 STUDY DESIGN OVERVIEW

The objective of this study was to evaluate effects of selenium on early life stages of RSC across a range of maternally derived egg selenium concentrations. Two approaches were undertaken to obtain selenium-exposed eggs: a laboratory spawning study and field collection of eggs from various locations in the Elk Valley. Main elements of the study design were as follows:

- The laboratory study described in Section 3.0 was conducted to attempt to generate a range of egg selenium concentrations in laboratory-reared RSC fed a range of dietary selenium concentrations.
- The field study described in Sections 4.0 and 5.0 was conducted by collecting adult RSC from surface waters with a range of aqueous and dietary (invertebrate) selenium concentrations. Eggs and milt were manually expressed and fertilized on-site, then incubated under controlled conditions at the Nautilus laboratory. Test endpoints included larval deformity, larval growth, and survival to complete yolk-sac absorption and onset of exogenous feeding. An aliquot of eggs from each clutch were collected for analysis of egg selenium concentrations. Toxicological and tissue chemistry data were used to evaluate whether adverse effects were observed that could be attributed to selenium in a dose-dependent fashion.

3.0 LABORATORY SPAWNING STUDY

To the best of our knowledge, culturing of RSC had not been conducted by a laboratory prior to the 2018 pilot study, and there are no standard protocols for spawning and rearing this species. Methods for laboratory spawning were based on known biology of RSC and general culturing techniques for other fish species.

Adult fish collected in spring 2018 and held at SFU did not show signs of development to spawning condition following three rounds of Ovaprim injections. Spawning attempts were terminated, and fish were held and maintained over simulated winter conditions (Golder et al. 2018). Additional fish were collected in late summer 2018 to supplement the number of fish held over winter. Fish were fed a range of dietary selenium concentrations (control, ~10 mg/kg dw, ~20 mg/kg dw, and ~30 mg/kg dw selenium in *Lumbriculus* worms fed selenium-enriched yeast) over approximately 10 months.

In spring 2019, fish were transitioned to conditions expected to stimulate spawning. Temperature and photoperiod were gradually increased to simulate seasonal changes until reaching 16-hours light:8-hours dark photoperiod and 12°C and were held constant thereafter. Because neither male nor female fish ripened naturally under these conditions, four injections of Ovaprim were administered on 16 May, 21 and 27 June, and 4 July 2019 to stimulate follicular development and ovulation in females and spermeation in males.

Despite the Ovaprim injections, there was no evidence of development to spawning condition in the female fish and the laboratory spawning study was discontinued (Appendix A).

4.0 FIELD STUDY METHODS

4.1 Sampling Strategy

Mature RSC were collected in 2019 by Minnow. Candidate locations for RSC collection were identified based on previous RSC observations (including RSC presence as documented in the Fisheries Information Summary System [FISS; BC ENV 2018] for nearby reference areas), reported selenium concentrations in water, sediment, and benthic invertebrates, and accessibility of sampling areas (Appendix B, Table B-1). From these candidate areas, six mine-exposed areas were selected for RSC collection (Minnow 2018b; Table 1 and Figure 1) expected to provide a gradient in egg selenium concentrations, including where relatively high RSC ovary selenium concentrations have been documented (Minnow 2018b; 2019a). Loon Lake was selected as the primary reference

area for the 2019 field survey based on observations in 2018 of large numbers of RSC and low egg selenium concentrations (Golder et al. 2018). Grave Lake was considered for inclusion as a second reference area if ripe fish could not be captured at Loon Lake.

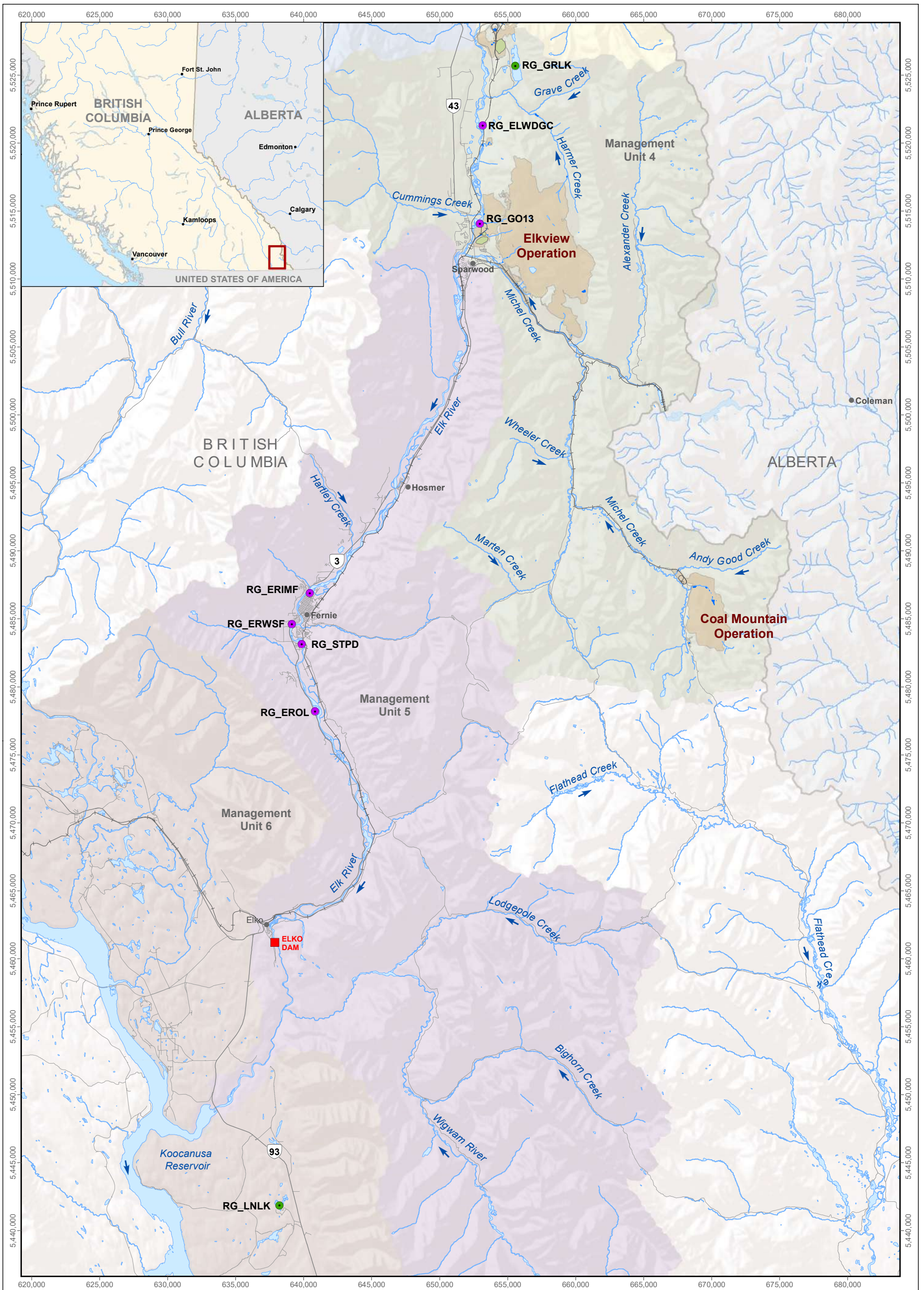
The strategy for the program was to collect adult RSC upon initiation of spawning, anticipated to begin in May and last for several weeks (Lindsey and Northcote 1963), so that ripe gametes could be extracted on-site and eggs fertilized before transport to the laboratory for rearing. In early May, field crews were deployed to the sampling areas listed in Table 1 to measure in situ water quality and undertake fishing three to four times a week using multiple fishing methods (standard operating procedures [SOPs] are described in Appendix C). When morphological features and/or early stages of spawning behavior were observed, Nautilus staff were mobilized for egg collection and fertilization.

Mature RSC were collected by Minnow between 6 May and 24 June 2019. A minimum of 35 mature females (15 from high selenium areas, 10 from moderate selenium areas, and 10 from reference) and 21 mature males (7 each from 2 mine-exposed areas and 2 from a reference area) were targeted. The number of targeted males assumed that all mature, ripe female fish would be caught in a single day of fishing, and sufficient milt would be obtained to fertilize them.

Table 1: Planned Sampling Areas for Redside Shiner, 2019

| Sampling Area (Area Code) ^a | UTM Coordinates (Zone 11, NAD83) | | Selenium Exposure Category | 2018 Selenium Concentrations (see Appendix B, Table B-1 for details) | | |
|--|----------------------------------|----------|----------------------------|--|---------------------|--------------------------|
| | Easting | Northing | | Water (µg/L) | Sediment (mg/kg dw) | Invertebrates (mg/kg dw) |
| Goddard Marsh (RG_GO13) | 652955 | 5514065 | High | 40-82 | 25 | 26 |
| Stanford Pond (RG_STPD) | 639864 | 5483139 | Moderate | 4.4 | 10 | 14 |
| Lower Elk River Oxbow (RG_EROL) | 640877 | 5477999 | Moderate | 1.3 | 4.4 | 12 |
| Elk River impoundment in Fernie (RG_ERIMF) | 640447 | 5486898 | Low | 0.09 | 0.68 | 2.7 |
| Elk River Wetland d/s Grave Creek (RG_ELWDGC) | 653175 | 5521300 | Moderate | 7.3 | 6.6 | 24 |
| Elk River Wetland South of Fernie (RG_ERWSF) | 639138 | 5484622 | Low | 0.4 | 1.4 | 3.2 |
| Koocanusa Reservoir (mouth of Elk River; RG_ER) | 627997 | 5447625 | Low | 1.2 | 0.67 | 7.7 |
| Koocanusa Reservoir (mouth of Gold Creek; RG_GC) | 630804 | 5436413 | Low | 1.8 | 0.35 | 3.0 |
| Loon Lake (RG_LNLK) Reference | 638220 | 5441850 | Low | <0.05 | Not collected | Not collected |
| Grave Lake (RG_GRLK) Reference | 655585 | 5525565 | Low | 0.32 | 2.9 | 3.7 |

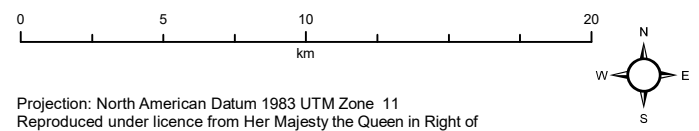
a) RG stands for "Regional" and is used in Teck site naming to differentiate samples collected or areas sampled under a regional program compared to a site-specific program. Hereafter, "RG" is not included in the area codes, except in Figure 1.
dw = dry weight.



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| | |
|--------------------------|--------------------------|
| Sampling Location | Settling Pond |
| Mine-exposed | Tailings Pond |
| Reference | Teck Coal Mine Operation |

Redside Shiner Supporting Selenium Toxicity Study Sampling Areas, 2019

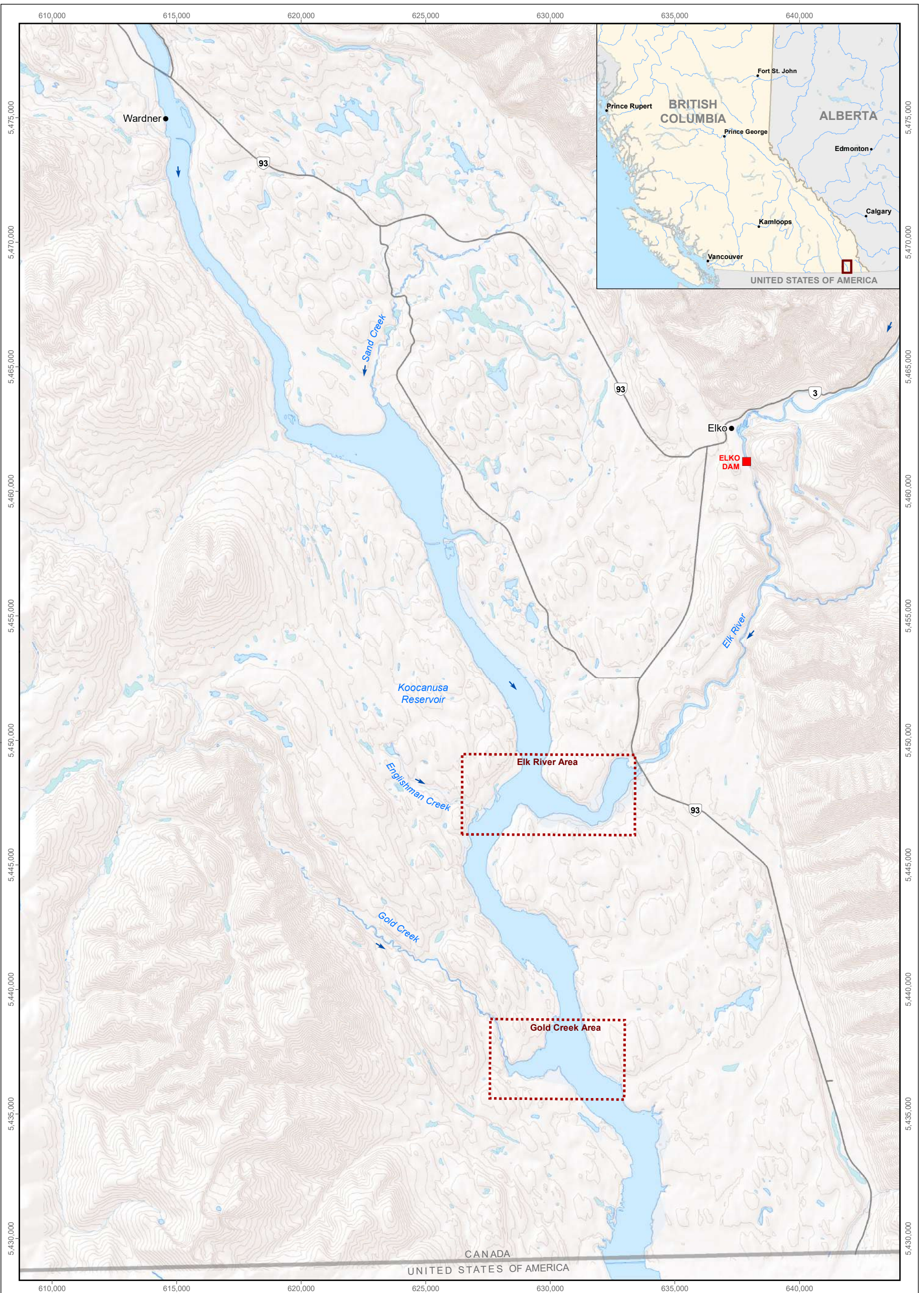



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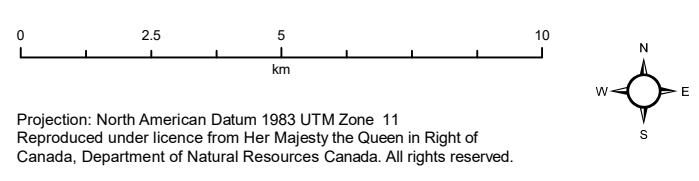


Figure 1



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 Approximate Fish Sampling Area

Redside Shiner Sampling Locations, Kootenai Reservoir, 2019



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Figure 2

4.2 Sampling Methods

Because spawning RSC are known to congregate proximate to flowing water (Weisel and Newman 1951; Lindsey and Northcote 1963), an initial habitat assessment was conducted to identify potential spawning areas within targeted sampling areas. Fishing effort was focused on areas of inflow and outflow, as well as areas where congregating fish were observed. Fish collection followed protocols specified in BC Fish Collection Permits CB19-474596 and CB19-471215.

Fish were captured using very short-set, small-mesh gill nets (Koochanusa only), minnow traps, mini hoop nets, angling, and/or seine nets, as appropriate. Gill nets ranging in length from 15 to 23 m with mesh sizes of 0.5" to 1" were deployed extending from the shoreline outward and set for a maximum of 15 minutes. Minnow traps were baited with cat food that was placed in a screened (<1 mm mesh), 250-mL container to prevent fish from accessing the food. Minnow traps were set on the bottom in shallow areas near the shore. After approximately 24 hours, traps were checked and re-set, as necessary. Mini hoop nets (24" × 24" frame; 0.5" mesh size) were deployed for between 24 and 48 hours, after which nets were checked and re-set, as necessary. Angling was conducted using a 4 m telescopic fishing pole equipped with 4 m of 3.5-lb test monofilament, a small bobber, split shots, and a size 18 hook. The hook was baited with an artificial maggot and placed in the water as close as possible to the school of RSC. When a fish swallowed the bait, it was quickly pulled out of the water, de-hooked, and placed in a cooler with clean aerated site water prior to further screening or processing. Seining was conducted using a 15 m × 0.9 m net with a 0.3-cm mesh size by wading into the waterbody and attempting to corral fish into the net. Fish were identified and enumerated according to capture method, and non-target species or immature RSC were released at the point of capture. All fishing locations were recorded using a Global Positioning System.

RSC with spawning colours were placed in a cooler with site water and aerators, and fish were retained for further screening. Water temperature and dissolved oxygen levels were regularly monitored in the coolers. Individual ripe fish were anaesthetized using clove oil, measured for total length, fork length, and total body weight, and eggs and milt were expressed by application of pressure to the abdomen. Because guidance does not exist on the identification of fully ripe eggs, several attempts at gamete collection/fertilization were made prior to understanding and recognizing characteristics required of ripe fish for successful fertilization (refer to Section 7.2). Care was taken not to over-express fish to avoid collecting unripe eggs and contaminating the sample with blood. Males and females that did not easily express gametes were placed in an aerated recovery bath. Nautilus staff with experience expressing gametes were present to fertilize eggs immediately upon collection and prepare egg samples for holding and transport. Eggs were fertilized on-site by using a combination of dry and wet fertilization. The sequence of events was as follows: milt from males was expressed and pooled in a small container which was placed under a padded icepack to keep milt as cool as possible without risk of freezing. An individual female was anesthetized, and eggs expressed onto a glass slide and transferred into a Petri dish. Next, a small volume of pooled milt (approximately 1 mL) was placed on the eggs and gently mixed. After a short dry fertilization period, a small volume (enough to cover the eggs) of clean reconstituted moderately hard water (US EPA 1985) was added to the milt/egg mixture, and the eggs were allowed to fertilize under wet conditions for several minutes. Following a second rest period, eggs were transferred to a transport container with up to 1 L of laboratory water (reconstituted moderately hard). Additional details regarding timing and method development are provided in Section 7.2. Egg clutches from individual fish were kept separate and fertilized and reared as separate batches (Section 5.2). Female fish that produced ripe eggs were sacrificed, and male fish and unripe female fish were transferred to a recovery bath. All RSC that were not sacrificed were released to the sampling area from which they were collected.

Prior to the 2019 study, ovaries collected from RSC in Koocanusa Reservoir in late April or Loon Lake in early May 2018 were likely comprised of unripe eggs because of the timing of sampling, the size and colour of eggs, and the difficulty in extracting eggs, and therefore likely do not represent the selenium concentrations of ripened eggs that undergo fertilization. To address this uncertainty, paired selenium concentrations were measured in the ripe eggs that were fertilized and the residual ovaries within individual fish (Section 5.1). Prior to fertilization, sub-samples of expressed, ripe eggs were collected and placed into pre-labelled, metal-free, 15-mL tubes. Residual ovaries were excised from each fish from which ripe eggs were collected (for fish dissection SOP, refer to Minnow 2019b in Appendix C). Total residual ovary weights were recorded using a digital balance (± 0.001 g), and each ovary was packaged into a pre-labelled Whirl-Pak[®] bag and frozen prior to analysis. In addition, two skinless, dorsal muscle samples were collected from each fish. All tissue samples were stored frozen at -20°C prior to being shipped to the analytical laboratory for analysis. Frozen ripe egg samples were shipped to the Nautilus laboratory for storage (Section 5.1).

Mature female RSC retained for sampling were weighed using a digital balance (± 0.001 g) and measured for total and fork length using a measuring board (± 1 mm). Total body weights were measured before and after ripe eggs were expressed and collected, and liver weights were measured after dissection. Obvious external deformities, erosions (fin and gill), lesions, tumours, and parasites observed during processing were recorded on field sheets. Ageing structures (otoliths) were collected by excising and freezing the head and sending it to the analytical laboratory (AAE; refer to laboratory report in Appendix D for a description of the ageing protocol).

Fertilized eggs were transported by Nautilus staff via vehicle and air under Permit 119127 to the laboratory in Burnaby, BC. Care was taken to minimize mechanical disturbance from handling and to limit temperature fluctuations, and a visual inspection was requested at airport security so that X-ray of the shipment was not needed. If eggs were being held prior to transport, efforts were made to maintain holding temperature at $14\pm 3^{\circ}\text{C}$, within the range measured at the collection areas. Transportation of eggs occurred between 1 hour and 2 days post fertilization. Temperature was measured upon arrival at the laboratory.

All field notes and measurements were recorded on standardized field data collection forms. Field water quality measures (temperature, dissolved oxygen concentration and percent saturation, specific conductance, and pH) were collected during each visit to the waterbody. Weekly water samples for chemical analysis were collected at areas that were being actively fished, and were analyzed for total and dissolved metals, nutrients, major ions, and other conventional parameters (e.g., total suspended and dissolved solids, and total and dissolved organic carbon).

Field quality assurance/quality control (QA/QC) measures included use of staff trained in the various field sampling techniques and fish identification. General protocols for field QA/QC outlined in the regional aquatic effects monitoring (RAEMP) study design were followed (Minnow 2018c).

5.0 LABORATORY METHODS

5.1 Analytical Chemistry

Subsamples of dorsal muscle tissue and residual ovaries (i.e., following collection of ripe eggs) were collected by dissection and submitted for chemical analysis at the Saskatchewan Research Council (SRC; Saskatoon, SK). Total selenium was measured by high resolution inductively coupled plasma mass spectrometry (HR ICP-MS). Moisture content was measured by freeze drying.

Measurement of selenium in each clutch of ripe eggs is required to characterize the concentration-response relationship. If clutch sizes are small, this restricts the number of eggs available for analysis, complicating the analysis, and use in the toxicity study. The subsamples of ripe eggs were stored frozen at -20°C at the Nautilus laboratory and results of a separate method validation study were used to inform selection of the analytical method for the smaller volumes of ripe eggs.

As an alternative to standard HR ICP-MS methods, use of laser ablation ICP-MS at TrichAnalytics (Saanichton, BC) was investigated because analysis of a smaller sample size is possible using this method (i.e., <5 mg dw). This alternative method required method validation to confirm that measurements are comparable to those using HR ICP-MS. To support method validation, samples of dorsal muscle and residual ovaries from field-collected fish were split and analyzed by SRC and TrichAnalytics. A comparison of the dorsal muscle and ovary tissue results between analytical methods is provided in Appendix E. Results from a separate, more detailed, method validation study of selenium analysis in different tissues are reported under separate cover (Golder 2020 in draft). Composite samples of ripe eggs were analyzed by TrichAnalytics using laser ablation ICP-MS because of the small sample volumes.

Analytical laboratory QA/QC measures included use of laboratory duplicates, certified reference material, and reporting of method detection limits. Initial wet weight of all samples was also reported by the laboratory.

5.2 Egg Incubation

Upon arrival at the Nautilus laboratory, water temperature was recorded, and eggs placed in an environmental control testing chamber held at $14 \pm 2^\circ\text{C}$. To minimize stress following transport and allow equilibration to laboratory conditions, eggs were not transferred to rearing containers until at least 12 hours after arrival. Water renewals (approximately 80%) occurred daily and water quality parameters (temperature, dissolved oxygen, and pH) were measured pre- and post- water renewal. Rearing water consisted of reconstituted moderately hard water. When eggs from a female were observed to be in the gastrula period (using a dissection microscope), which generally occurred three or four days following arrival at the laboratory, an assessment of fertilized eggs was conducted; eggs that had not developed to the gastrula stage were assumed to be unfertilized. Fertilized eggs were counted and divided into replicate containers labeled with the identity of the female fish and replicate name, targeting four replicates, each with 50 fertilized eggs. Due to the varying number of collected and fertilized eggs, the number of replicates and eggs per replicate varied across females. Containers were randomly distributed within the environmental chamber and provided continuous gentle aeration.

Eggs were monitored daily for mortality and hatch. When observed, hatched fish were transferred to a secondary, 2-L rearing container that corresponded to the same replicate. Except for water volume, rearing conditions remained the same and loading density was consistent with Environment Canada guidance for similar fish (Environment Canada 2011). Observations regarding hatch mortality were also recorded daily.

Laboratory QA/QC measures implemented during the rearing period were:

- Control water was measured for chlorine weekly and total metals and metalloids by ICP scan approximately monthly throughout the rearing period to confirm that the water supply was of suitable quality. Water in the development chambers was monitored daily for temperature and dissolved oxygen (e.g., target 80-100% saturation). Dissolved oxygen, conductivity, and pH were measured before and after water renewals.
- Appropriate test conditions were maintained at all times (e.g., temperature, lighting, aeration). Daily monitoring was documented; deviations were documented and their implications on data quality considered.
- Test personnel had hands-on experience with early life stage testing with fish.

- Embryo survival for fish collected from reference areas was not an appropriate QA/QC criterion. However, significant embryo mortality during the test would be a signal to examine test conditions and procedures. Embryo mortality is discussed in Section 7.4 with respect to implications on the utility of other toxicological endpoints.
- Standard laboratory and good house-keeping practices were utilized on all laboratory instrumentation and materials to reduce the risk of cross-contamination between batches of eggs and exposure containers.

5.3 Test Termination

When yolk sac absorption was completed (20 to 21 days post fertilization), fish were euthanized using Tricaine mesylate (CAS 886-86-2). All fish were assessed for deformities using a Graduated Severity Index (GSI; Table 2) as described and used by Holm et al. (2003) and Rudolph et al. (2008). The maximum possible total GSI score is 12 based on a score of up to three in each of four categories. Twenty fish from each replicate were randomly selected and measured for individual fish length. When the number of fish per replicate was less than 20, all fish were measured for length. Following length and deformity assessments, fish were pooled and dried at 60°C for a minimum of 24 hours after which dry weight was measured.

Table 2: Graduated Severity Index (GSI) for Evaluating Larval Fish Deformity

| GSI | Category | | | |
|-----|---|---|--|--|
| | Skeletal | Craniofacial | Finfold | Edema |
| 0 | Normal backbone. ($\leq 15^\circ$) | Normal jaw, face and head. | All fins present and normal. | No fluid accumulation in head or pericardial cavity. |
| 1 | Slight ($15-44^\circ$) lordosis, scoliosis or kyphosis. Unlikely to impair fish movement. | Slightly reduced ($<20\%$) or malformed eye or jaw. Unlikely to impair feeding ability or sight. | One or two fins slightly ($<50\%$) reduced in size or slightly malformed. Unlikely to impair fish movement. | Slight ($<20\%$ of volume of normal) fluid accumulation, but unlikely to impair sight, movement or feeding. |
| 2 | Moderate ($45-89^\circ$) lordosis, scoliosis or kyphosis. Likely to impair fish movement. | Moderately ($20-49\%$) reduced or malformed eye or jaw. Likely to impair feeding ability or sight. | More than two fins slightly reduced in size or slightly malformed, or 1 or 2 moderately ($\geq 50\%$) deformed fins. Likely to impair fish movement. | Moderate ($20-49\%$ of normal volume) fluid accumulation. Likely to impair sight, movement or feeding. |
| 3 | Severe ($\geq 90^\circ$) lordosis, scoliosis or kyphosis. Fish movement likely to cease or be greatly impaired. | Severely ($\geq 50\%$ or missing) reduced or malformed eye or jaw. Feeding ability or sight severely impaired. | One or more missing fins, or two or more moderately ($\geq 50\%$) deformed. Swimming ability severely impaired. | Severe ($\geq 50\%$ of normal volume) fluid accumulation. Greatly reduced sight, movement or feeding. |

Laboratory QA/QC measures implemented during deformity analysis were:

- Deformity analyses were conducted by technicians with training and experience in fish deformity analyses.
- Blind labelling: All test containers and preservation vials were labelled in a manner to prevent the technician from knowing the identity of any fish. Observers did not have knowledge of whether larval fish originated from a high-selenium area.
- *A priori* framework: An *a priori* framework for the GSI scoring system was prepared based on Table 2.
- Photos: Photographs from a representative selection for each type and severity of fish deformity and photographs of normal fish were used as a guide for the GSI framework.
- External observer: A minimum of 10% of the larval fish were examined by an external observer not involved in the original scoring.

6.0 DATA ANALYSIS

Data were analyzed using Systat™ version 13, which supported analysis of concentration-related toxicological data using linear and non-linear regression. The objective of this analysis was to test for concentration-response relationships relating reproductive effects endpoints to egg selenium concentrations. Concentration-response analyses for deformity endpoints were conducted with a consideration of total GSI scores 1 or more (i.e., any deformity in any category) and total GSI scores of 2 or more (i.e., significant deformity in one category or a minor or greater deformity score in two or more categories).

7.0 RESULTS

7.1 Field Collection

Spawning RSC were observed at sampling areas within the Elk Valley starting in May, and in June within Koocanusa Reservoir. In total, eggs from 56 ripe female RSC were collected (i.e., 10 from Loon Lake, 13 from ERIMF, 14 from Koocanusa, 3 from ERWSF, and 16 from STPD; Table 3). Total aqueous selenium concentrations in areas where fish were caught for the study ranged from <0.050 to 16 µg/L (Appendix Table D.1¹).

Because no guidance exists for evaluating spawning RSC, the initial field effort focused on developing a procedure for identifying ripe fish. This effort involved identifying fish with sufficiently developed spawning colours, determining when females were gravid, and identifying females with eggs that could be successfully fertilized. RSC caught in Loon Lake were the first to clearly display spawning colours in both males and females (Appendix D Photographs). Photographs of these fish were distributed among the study team as an indication of colouring that should be observed in spawning fish. However, it was later determined that fish in Loon Lake had particularly vivid spawning colours compared to other areas where mature females were collected, and so the team refocused their screening to include fish with subtle colouration.

Given that no guidance for RSC exists on expressing viable eggs from mature females, the first attempt to fertilize eggs collected from Loon Lake and ERIMF resulted in unsuccessful fertilization. Observations made in the days following fertilization indicated that the eggs were not viable (i.e., eggs were white, perivitelline space between the plasma membrane and chorion of the fertilized egg was not visible). Moderate pressure was required to express eggs and the expressed eggs were clumped and consisted of multiple sizes. Observations and results from the first fertilization event suggested the females collected were not sufficiently ripe. During the second fertilization event, females that did not express eggs with light pressure to the abdomen were considered to be insufficiently ripe. When eggs were found to be readily expressed with light pressure, they were uniform in size and well coated in ovarian fluid. The perivitelline space was observed when assessed 15 minutes post-fertilization. Methods to identify ripe females that included visible bulge in abdominal area and application of light pressure to express eggs, were adopted thereafter. Ripe females were found at ERIMF and STPD that easily expressed eggs of a consistent size and surrounded by plenty of ovarian fluid.

Spawning populations of RSC were observed at Loon Lake a reference area and five mine-exposed areas (ERIMF, ERWSF, STPD, and the two Koocanusa Reservoir areas) (Table 3; Appendix Tables D.4 to D.8). RSC were observed in moderate to large numbers at EROL and Grave Lake, but there were no clear signs of fish preparing to spawn during the study (Table 3; Appendix Tables D.6 to D.8). RSC were not caught at ELWDGC,

¹ A data quality review of the water quality data (Appendix D) indicated good laboratory precision and reproducibility, field reproducibility, and minimal contamination (Tables D.2 and D.3). As such, water quality data were considered reliable. Laboratory reports are included in Appendix D.

and very few fish were caught at GO13, of which none displayed evidence of spawning (Appendix Tables D.4 to D.5). Fishing was conducted at the 10 study areas for 1 to 7 weeks (Appendix Table D.9). Fishing effort was stopped at four study areas where no spawning RSC were observed, including three mine-exposed areas (ELWDGC, EROL, and GO13), and a reference area (Grave Lake). At ELWDGC, fishing was stopped after one week of daily fishing effort at multiple locations using multiple methods (hoop net, minnow trap, seine) (Appendix Tables D.6 to D.8). No clear signs of spawning colours or gravid females were observed at EROL after 23 days and fishing was stopped (Appendix Tables D.6 to D.8) because 19 ripe female RSC with viable eggs were caught at two other areas with similar exposure (3 at ERWSF and 16 at STPD; Table 3). Fishing was stopped at GO13 after three weeks of fishing using multiple methods yielded 7 fish in total, of which only one female fish was documented (Appendix Tables D.6 to D.8). At the Grave Lake reference area, no clear signs of spawning colours or gravid females were observed after 15 days, and fishing was stopped once it was confirmed that eggs collected from the Loon Lake reference area were successfully fertilized.

Mature female RSC were between 5.6 and 12.1 cm, with total body weights prior to expressing eggs between 2.3 and 23 g (Appendix Table D.10). Gonadosomatic indices were between 5 and 26%, with median values at the six sampling areas between 14 and 18% (Appendix Table D.10). This range is consistent with previous observations of spawning RSC in the Columbia River, Washington ($\geq 8\%$; Gray and Dauble 2001). Mature females were between 1 and 5 years old, which represents a wider age range than previously noted for sexually mature females (reaching maturity between 2 and 4 years; Lindsey and Northcote 1963; Gray and Dauble 2001). None of the fish collected for tissue analysis in the study had external anomalies or deformities (Appendix Table D.10).

Consistent with previous observations of RSC spawning populations (Weisel and Newman 1951; Lindsey and Northcote 1963; Gray and Double 2001), RSC observed in this study appeared to spawn over several weeks. At Loon Lake, RSC were spawning at the start of the field program, and the spawning school was present for 16 days of monitoring (Appendix Table D.10). Similarly, eggs were collected from mature females from STPD over a three-week period (Appendix Table D.10). Field monitoring was stopped once the required number of fish for the study were collected.

All mature females used in the present study had residual ovaries with underdeveloped eggs, following easy expression of ripe eggs, which is consistent with previous observations of RSC as fractional spawners (Weisel and Newman 1951). A small proportion of the total number of fish caught in each area were mature females with eggs that could be easily expressed and fertilized. The RSC at Loon Lake, ERIMF, ERWSF, and STPD were likely spawning upon the initiation of sampling in the first half of May, and only 0.3%, 0.4%, 4.6%, and 2.2% of the total number of fish caught had eggs that could be easily expressed and fertilized (Table 3). Thus, only a small proportion of female fish in a population appeared to be actively spawning on a given day.

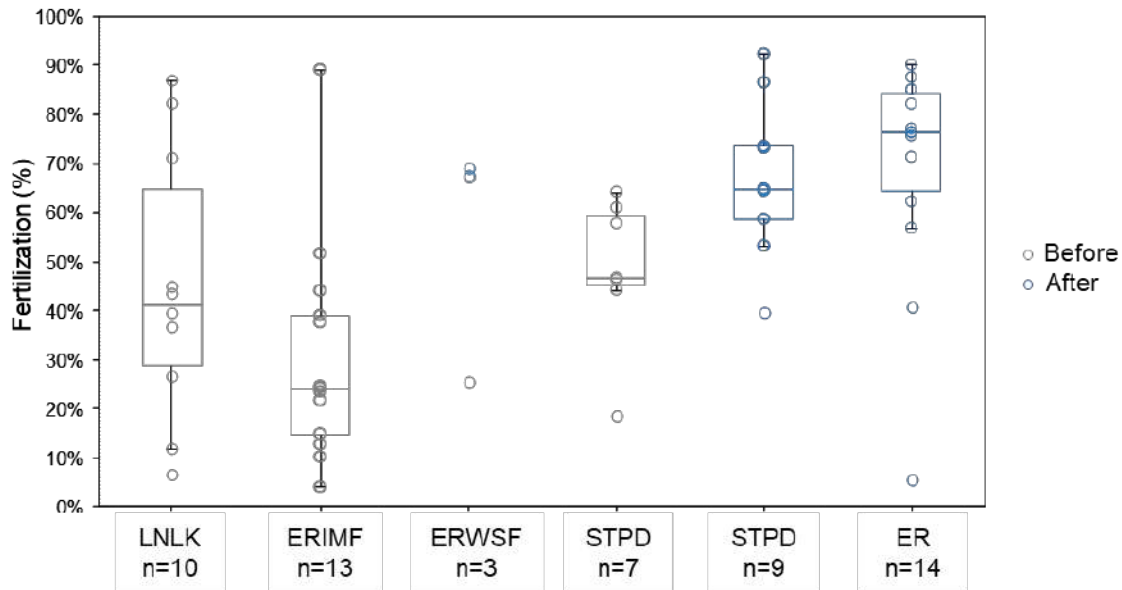
Table 3: Viable Catch Data from 2019 Redside Shiner Collection

| Area Description | Area Code | Total Caught | # Females | % Females with Fertilizable Eggs ^a |
|-----------------------------------|--------------------|--------------|----------------------|---|
| Loon Lake reference | LNLK ^b | 3,508 | 10 (10) ^c | 0.3% |
| Grave Lake reference | GRLK | 7,392 | - | 0% |
| Koocanusa (Englishman Creek) | ER | 1,548 | 3 | 0.2% |
| Koocanusa (Gold Creek) | GC | 4,185 | 11 | 0.3% |
| Elk River Impoundment in Fernie | ERIMF ^b | 3,513 | 13 (3) ^c | 0.4% |
| Elk River Wetland South of Fernie | ERWSF ^b | 66 | 3 | 4.6% |
| Lower Elk River Oxbow | EROL | 468 | - | 0% |
| Stanford Pond | STPD ^b | 730 | 16 | 2.2% |
| Elk River Wetland d/s Grave Creek | ELWDGC | 0 | - | 0% |
| Goddard Marsh | GO13 | 7 | - | 0% |

- a) Number of females used in the study divided by the total number of fish caught over the duration of the field sampling program.
b) Areas where RSC populations were likely spawning upon initiation of monitoring.
c) Unsuccessful fertilization in parentheses.

7.2 Field Fertilization

To the best of our knowledge, manual expression and fertilization of RSC gametes had not been conducted prior to this study therefore some method development between fertilization events was necessary. After the first four fertilization events, the mean percent fertilization was 40%, suggesting that efforts to optimize fertilization methods should be undertaken. During the initial four rounds of fertilization, the duration of the dry fertilization period was between 5 to 10 minutes, while the wet fertilization period was between 10 to 15 minutes. It was hypothesized that higher fertilization percentages might be observed when eggs underwent shorter, dry fertilization periods since the small size of the eggs made them potentially subject to drying. To test this hypothesis, eggs from one newly expressed female (ERWSF-02) were separated into two groups; one group was dry fertilized for approximately 2 minutes while the second group for approximately 15 minutes. The short, dry fertilization period resulted in 68% fertilization while the longer period resulted in a 25% fertilization. Based on these results, fertilization methods were revised to include a short, dry fertilization of 2 minutes. The mean fertilization percentage of eggs increased to 69% following implementation of this method development (Figure 3).



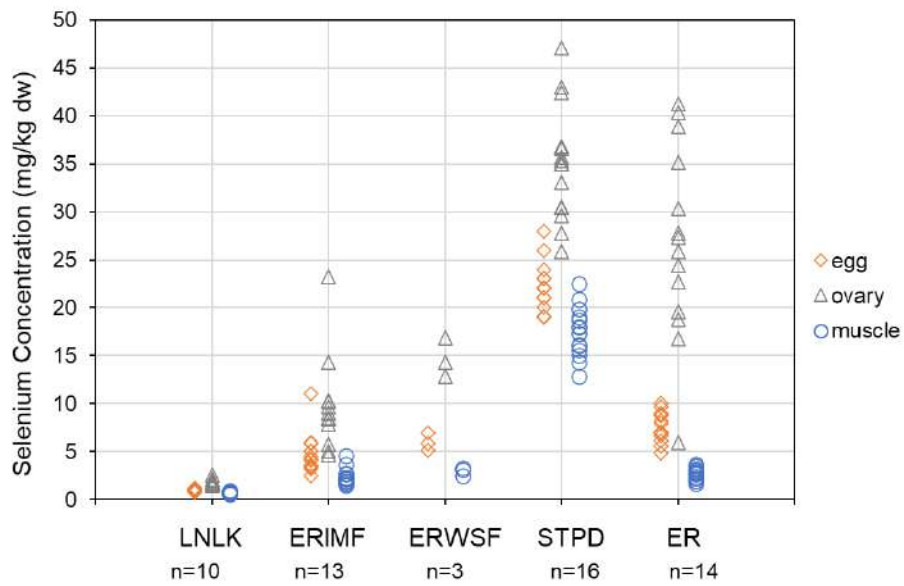
Note: Boxplots and individual data points for percent fertilization before (grey) and after (blue) method refinement. Boxplots demonstrate interquartile range (25th and 75th) and median value (horizontal line within box). Whiskers represent minimum and maximum values unless outliers were present, in which case whiskers were only extended to the next value, when present within 1.5-times the inter-quartile range. One batch of eggs, ERWSF-02, was split and fertilized following two methods for comparison; both values are shown in the figure, but the reported n value does not double count this split. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kooconusa Reservoir.

Figure 3: Percent Fertilization of reidside shiner eggs before and after change to short, dry fertilization period.

7.3 Tissue Chemistry

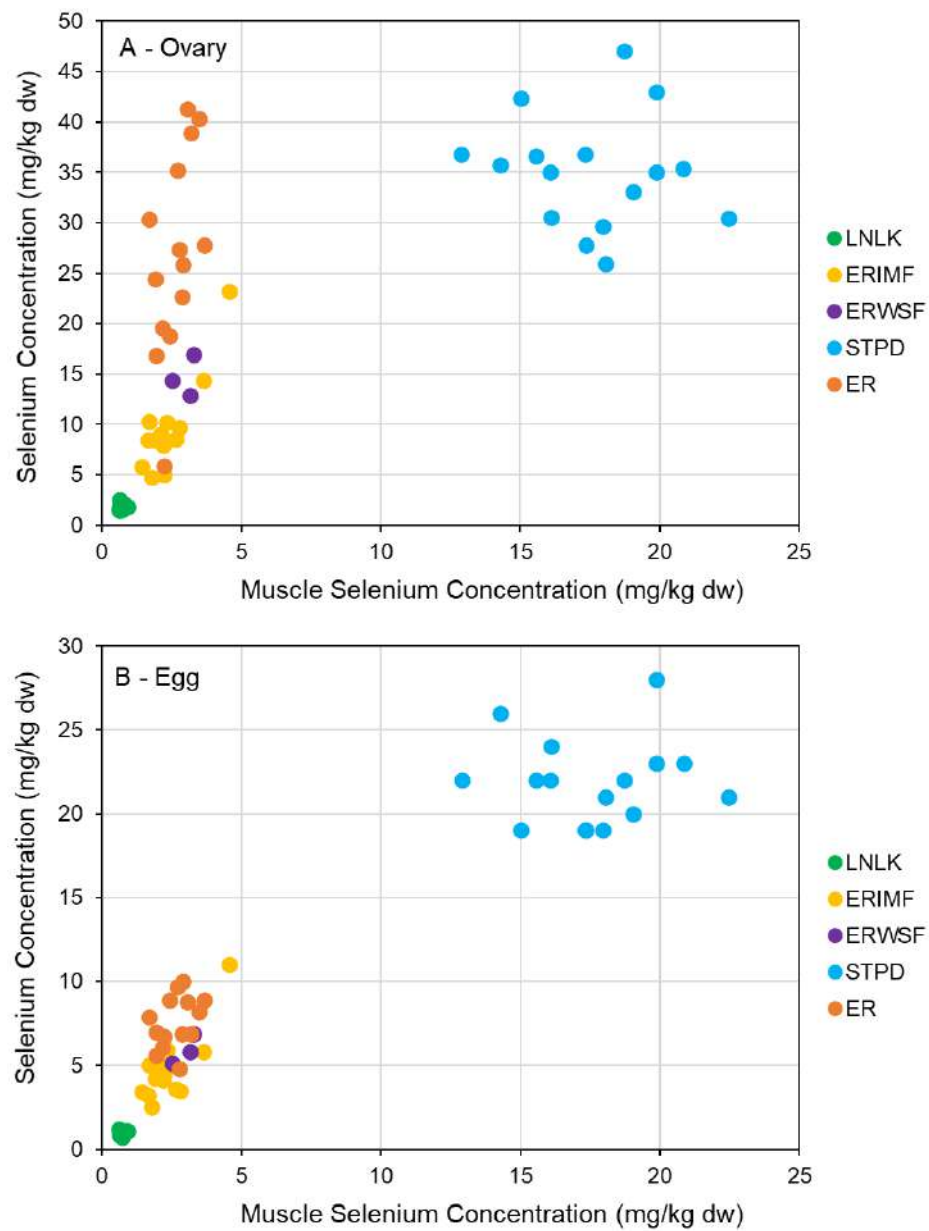
Tissue chemistry laboratory reports are provided in Appendix E. Selenium data reported by TrichAnalytics were relied upon for the interpretation of results and the concentration-response relationships (Section 7.5) because this allowed comparison across all tissue types. A comparison of dorsal muscle and ovary selenium results from SRC and TrichAnalytics is provided in Appendix E and showed good agreement of results for both tissue types between analytical methods.

Ten adult female fish were collected from Loon Lake reference area for tissue chemistry analysis. Selenium concentrations for RSC from Loon Lake ranged from 0.71 to 1.2 mg/kg dw in eggs, 1.5 to 2.6 mg/kg dw in ovary and from 0.6 to 0.9 mg/kg dw in dorsal muscle. RSC from mine-exposed areas had a range of selenium concentrations from 2.5 to 28 mg/kg dw in eggs, 5.0 to 47 mg/kg dw in ovary, and 1.4 to 23 mg/kg dw in dorsal muscle (Figure 4). RSC from STPD had higher selenium concentrations in eggs, ovary, and muscle compared to other sampling areas (Figure 4; Figure 5). Selenium concentrations in ovary were higher than in eggs, particularly for RSC from Kooconusa Reservoir (ER; Figure 5; Figure 6). Similar differences between ovary and egg selenium concentrations were observed in the Elk Valley mountain whitefish study (Nautilus 2017). On average, RSC ovary selenium concentrations were 2 times higher than egg selenium. Ovary results should be interpreted with caution for RSC because they overestimate the exposure concentrations of developing embryos. Because of this, only ripe egg data were used for the evaluation of concentration-response relationships (Section 7.5).



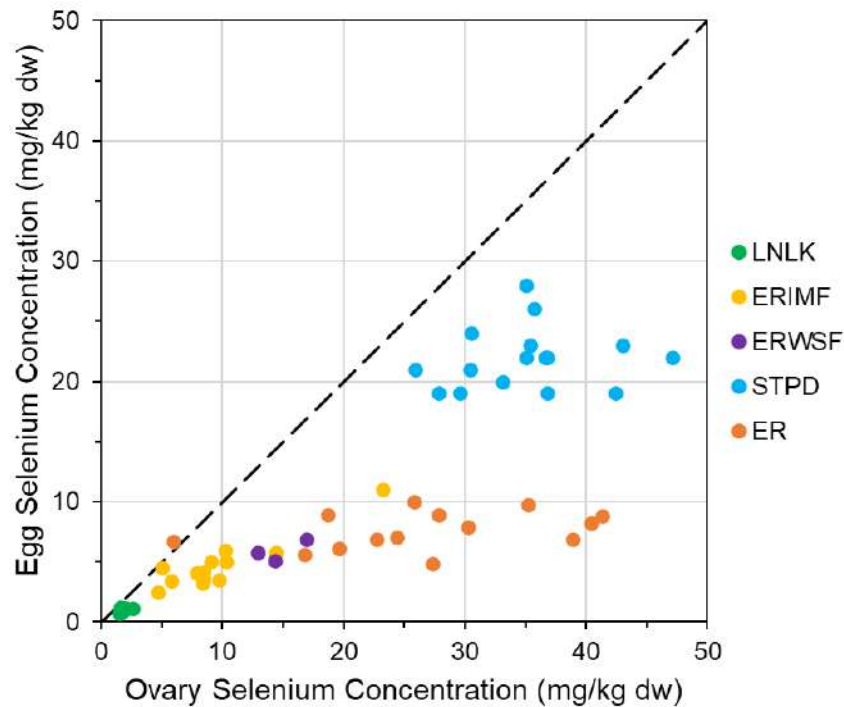
Note: Selenium data reported by TrichAnalytics. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kocanusa Reservoir.

Figure 4: Egg, ovary, and dorsal muscle selenium concentrations of reidside shiner from Elk Valley sampling areas, 2019.



Note: Selenium data reported by TrichAnalytics. Note different y-axis scales. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kocanusa Reservoir.

Figure 5: A) ovary and B) egg versus dorsal muscle selenium concentrations of redside shiner from Elk Valley sampling areas, 2019.



Note: Selenium data reported by TrichAnalytics. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Koocanusa Reservoir. Dashed line is 1:1 relationship.

Figure 6: Egg versus ovary selenium concentrations of reidside shiner from Elk Valley sampling areas, 2019.

7.4 Laboratory Rearing

A laboratory report prepared by Nautilus with raw data is provided in Appendix F. Water quality remained acceptable throughout rearing. Eggs were successfully transported to the laboratory by a combination of vehicle and plane between 3 hours and 2 days post-fertilization. Upon arrival, egg health was assessed and there was no evidence of damage or mortalities (white eggs). During egg rearing, there was no evidence of fungal growth and, therefore, prophylactic treatment of eggs was not required.

Larval RSC were terminated once yolk sac absorption was observed. This corresponded to 20 to 21 days post-fertilization and was consistent across females and collection areas. A small number of extra fish from the first successful fertilization event were reared in the presence of food and used to assess whether feeding of hatched fish was necessary. Once these additional fish were active, they were provided newly hatched *Artemia* nauplii, however they showed no signs of feeding (i.e., chasing or consumption of *Artemia*) prior to complete yolk sac absorption therefore larval RSC were not fed prior to test termination (yolk sac absorption).

Mean cumulative survival and standard deviation from fertilized egg to termination following yolk sac absorption was $84 \pm 24\%$ for the Loon Lake reference area. Survival ranged from 81% to 100% for embryos from 9 of 10 females and was 18% for embryos from the remaining female. The batch of eggs with low survival also had a 12% fertilization rate and yielded only 38 fertilized (viable) eggs. There were egg batches from other females from Loon Lake and other sampling areas that also exhibited low fertilization rates, but had high embryo survival; the reason for the low survival in that one batch from Loon Lake is unknown. The overall high survival of RSC from the Loon Lake indicates that it is reasonable to use the Loon Lake reference area to compare performance

observed in RSC originating from mine-exposed areas. Cumulative survival was high across all study areas, with a calculated mean and standard deviation of $85 \pm 17\%$ (Figure 7). The high survival results indicate that methods used in this study were suitable for successful rearing of early life stage RSC.

7.5 Concentration-Response Analysis

Concentration-response relationships were evaluated between the different RSC endpoints and ripe egg selenium concentrations. Statistical results for regression analyses are provided in Appendix G.

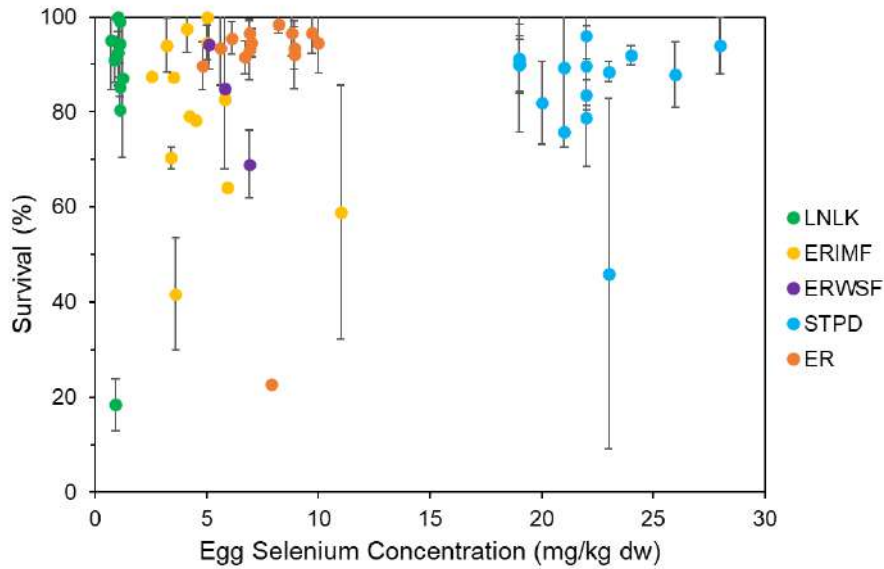
There was no apparent effect of egg selenium concentration on RSC survival (Figure 7) and ordinary least squares [OLS] regression indicated no significant relationship between survival and egg selenium concentration ($p > 0.05$). Relatively low survival was observed in one batch of eggs from Loon Lake with 18% survival (discussed in Section 7.4) and one batch of eggs from Kooacanusa Reservoir (ER) with 23% survival. Due to personnel constraints in the field, that ER female had been held overnight in a minnow trap before being manually expressed. Upon collection, eggs from that female were observed as sticky and clumped and that batch of eggs had a low fertilization rate of 5.7%. None of the other females were held overnight prior to gamete collection. Removal of these two batches did not change the outcome of the regression analysis ($p > 0.05$).

Mean percent fertilization of eggs was significantly higher (two-sample t-test, $p < 0.0001$) following refinement of field-fertilization methods (see Section 7.2). Concentration-response relationships evaluated separately for batches of eggs before and after method refinement showed no significant relationships between fertilization and egg selenium concentration (OLS regression; $p > 0.05$). Percent fertilization was typically less than 50% at egg selenium concentrations less than about 5 mg/g dw (Figure 8) because fish were first collected from reference and low selenium areas, and eggs from these fish had lower egg fertilization rates prior to refinement of the field-fertilization methods. Percent fertilization was not affected by selenium concentration.

Fish growth (length and dry weight) was consistent across batches of embryos (Figure 9) and showed no statistical difference between batches of eggs before and after refinement of field-fertilization method (two-sample t-test, $p > 0.05$). Mean fish length (\pm standard deviation) was 7.2 ± 0.4 mm and ranged from 6.5 to 7.9 mm. Mean fish dry weight was 0.35 ± 0.05 mg and ranged from 0.22 to 0.46 mg. Fish length was not affected by egg selenium concentration (OLS regression; $p > 0.05$). A statistically significant negative slope was observed for larval fish weight (OLS regression; $p = 0.01$), but the slope was shallow (slope = -0.002) and explained a small proportion of variation in the data ($r^2 = 0.12$). This relationship was driven by the Loon Lake fish weights that were slightly higher and less variable than other areas and was not statistically significant when these Loon Lake data were excluded (OLS regression; $p > 0.05$). Because the remaining areas captured a range of egg selenium from 2.5 to 28 mg/kg dw without showing a significant relationship, the shallow trend was interpreted to reflect ecological conditions in Loon Lake that affect fish growth, and not an effect of selenium.

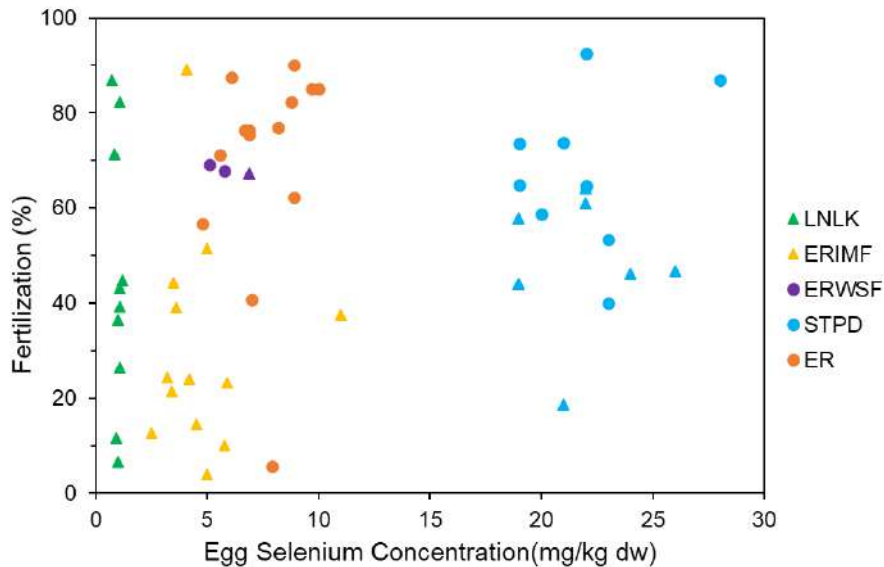
Similar to other endpoints, no significant relationship was observed between incidence of deformity and egg selenium concentration (OLS regression; $p > 0.05$; Figure 10). When considering fish with any deformity (total GSI scores 1 or more), the mean (\pm standard deviation) incidence of deformity was $10 \pm 18\%$ and ranged between 0% and 100%. The batch of eggs that yielded 100% incidence of deformity was the batch from Loon Lake that had 18% survival and 12% fertilization (Section 7.4). Of the 38 fertilized eggs reared in that batch, only 7 survived until test termination, and all exhibited a mild deformity. When only those fish with a significant deformity or multiple minor deformities were considered (total GSI score of 2 or more), the mean (\pm standard deviation) percent of deformed fish for all areas was $7.0 \pm 11\%$ and ranged between 0 and 47%. Several batches of eggs collected from ERIMF with lower egg selenium concentrations were observed with an incidence of deformity greater than 10% (Figure 10), suggesting that the higher incidence of deformity relative to other areas

may be related to site characteristics independent of selenium concentrations. Apart from this observation for some ERIMF samples, differences in incidence of deformity were not apparent between sampling areas (Figure 10).



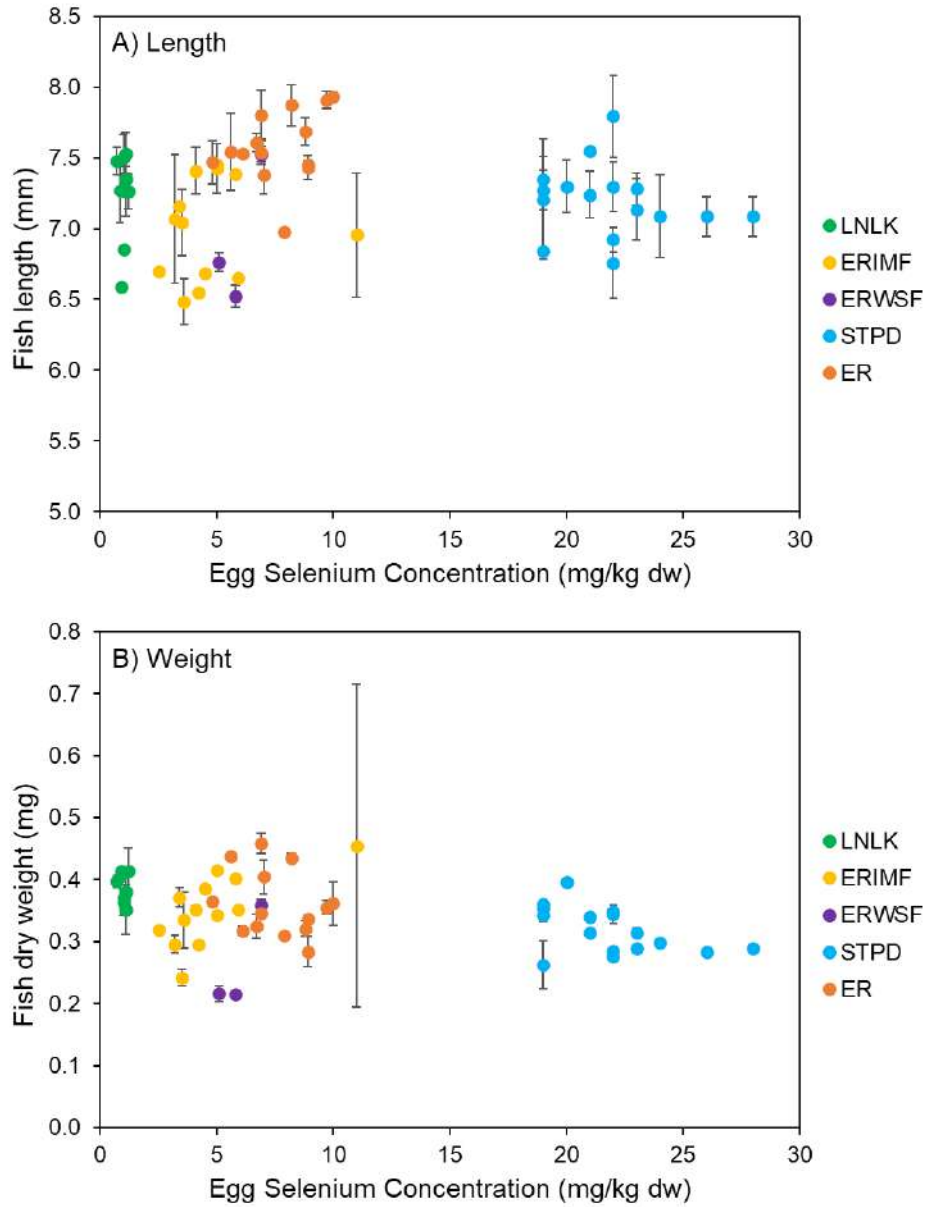
Note: Data are mean response and error bars are standard deviation. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kooocanusa Reservoir.

Figure 7: Survival of reidside shiner larvae versus egg selenium concentration.



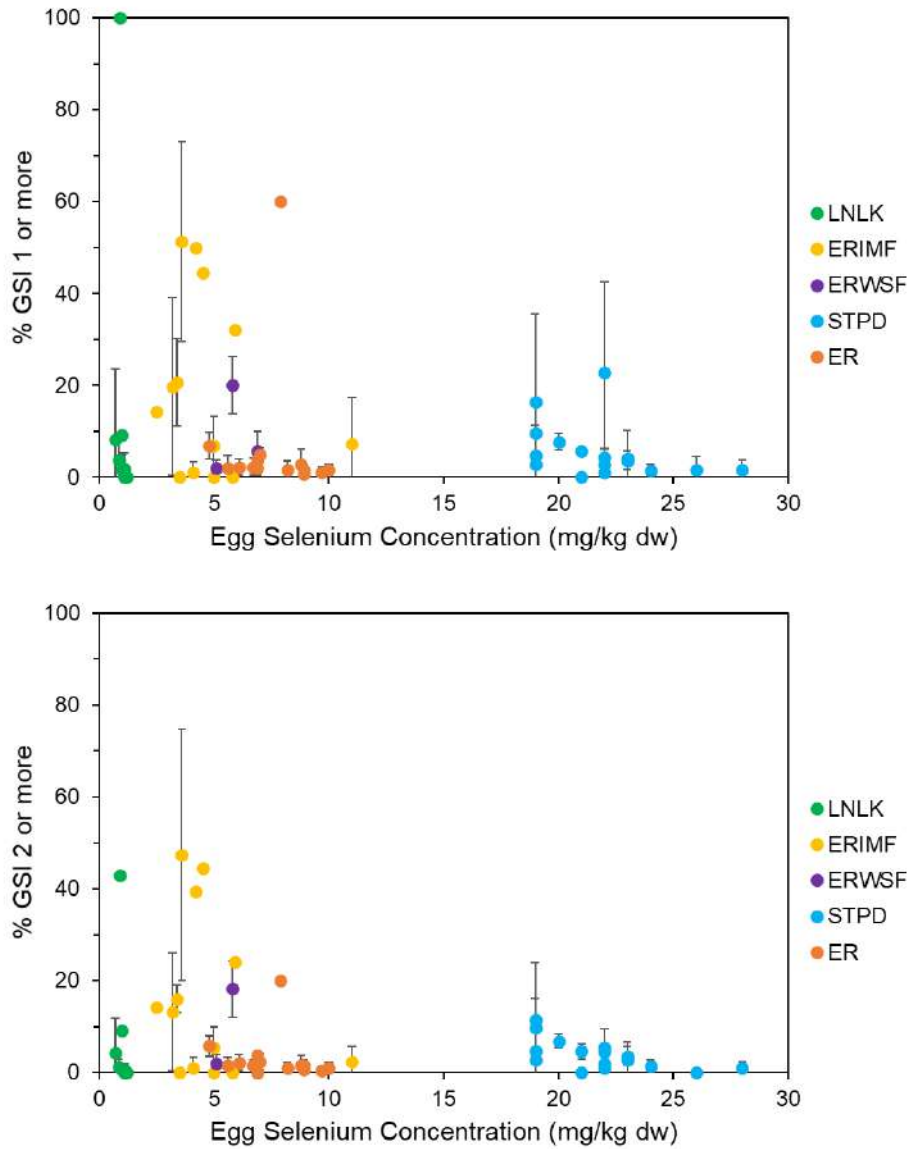
Note: Data indicate before (triangle) and after (circle) change to short, dry fertilization period. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kooocanusa Reservoir.

Figure 8: Percent fertilization of reidside shiner eggs versus egg selenium concentration.



Note: Data are mean response and error bars are standard deviation. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Koochanusa Reservoir.

Figure 9: Growth measured as length (A) and dry weight (B) of reidside shiner larvae versus egg selenium concentration.



Note: Data are mean response and error bars are standard deviation. GSI = Graduated Severity Index, see Table 2 for description of GSI categories. LNLK = Loon Lake reference area, ERIMF = Elk River impoundment in Fernie, ERWSF = Elk River Wetland South of Fernie, STPD = Stanford Pond, ER = Kocanusa Reservoir.

Figure 10: Deformity of reidside shiner larvae by severity level versus egg selenium concentration.

8.0 SUMMARY AND CONCLUSIONS

The 2019 field study observed spawning RSC at areas throughout the Elk Valley and in Koochanusa Reservoir. Procedures were developed to identify ripe females, such that viable eggs could be collected and fertilized in the field. It was observed that RSC spawn over several weeks as fractional spawners, with only a small proportion of fish caught that appeared to be actively spawning on a given day. With adaptations made during the field program, field-collection and fertilization were successful in obtaining batches of fertilized eggs. Transport to and rearing of eggs in the laboratory was successful with high survival rates overall. These results indicate that the field and laboratory methods used in this study were successful for obtaining and rearing early life stage RSC, which to the best of our knowledge is the first study of this kind with RSC.

Targeted collection of adult RSC from surface waters with a range of selenium exposure resulted in a field-derived range of selenium concentrations from 0.71 to 28 mg/kg dw in eggs and 1.5 to 47 mg/g dw in ovary. Ovary selenium concentrations were higher than in eggs and ovary data should be interpreted with caution because they overestimate the exposure concentrations of developing embryos. Ripe egg data should be used for the evaluation of selenium toxicity. There was no evidence of selenium effects on survival, growth, or deformity of RSC up to the maximum egg concentration of 28 mg/kg dw obtained in the study. Thus, the results of this study indicate that the threshold for reproductive selenium toxicity to RSC is >28 mg/kg dw.

9.0 CLOSURE

We trust that this report provides sufficient information for your present needs. Should you have any questions, please do not hesitate to contact the undersigned at 604-296-4200.

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APPENDIX A

Laboratory Spawning Study

Red side shiner: Fertilization

Injectors

Date: July 9/2018

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|-------------------|---------|------|--------|-----------------|-------------|------------------------------|--|
| | | Male | Female | | | | |
| 3A | P1 | ? | ? | 1.95 | | N | |
| Loonlake 2A 54 | 1 | | X | 14.57 | 13.0 | | Hemorrhaging around pectoral fins? (pre-injection); red stripe |
| Loonlake 2A 54 | 2 | X | | 10.06 | 9.4 | | Hemorrhaging " " " ? |
| Loonlake 1B 55 | 3 | | X | 12.96 | 10.2 | | Healthy |
| " " | 4 | * | X | 19.90 | 11.7 | | |
| " " | 5 | | X | 13.79 | 10.4 | | Moved into 11B |
| 11B | 6 | X | | 7.8 | 8.4 | | Manually expelled some Milt (V.M.Mor) → Moved into 55 |
| 11B | 7 | X | | 8.56 | 9.2 | | |
| 11B | 8 | | X | 9.86 | 8.9 | | |
| 11B | 9 | X | | 11.12 | 9.7 | | |
| 11B | 10 | | X | 14.08 | 11.6 | | |
| 11B | 11 | | X | 10.74 → | 15.12 | | |
| 11B | 12 | X? | | 9.6 | 9.7 | | |
| 11B | 13 | | X | 10.04 | 9.2 | | |
| 11B | 14 | | X | 15.48 | 11.2 | | Largest distended Body |
| 11B | 15 | | X | 15.12 | 11.0 | | |
| 11B | 16 | | X | 11.64 | 8.9 | | |
| EROLIA | 17 | | X | 2.52 | 6.2 | | Missing some scales |
| EROLIA | 18 | X | | 3.72 | 7.1 | | |
| EROLIA | 19 | | X | 2.31 | 6.1 | | |
| EROLIA | 20 | | X | 5.03 | 7.4 | | |
| EROLIA | 21 | | X | 4.68 | 8.2 | | |

↳ Female or unknowns

BSL
Dec 21/2019

Red side shiner: Fertilization

Date: July 9/18

injections

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------------------------|---------|--------------|--------------|-----------------|-------------|------------------------------|--------------------------------------|
| | | Male | Female | | | | |
| EROLIA | 22 | X | X | 4.3 | 7.4 | | Missing some scales |
| EROLIA | 23 | X | X | 3.84 | 7.2 | | Missing some scales |
| EROLIA | 24 | | X | 3.28 | 6.7 | | |
| EROLIA | 25 | | X? | 2.71 | 6.6 | | Looking a little sick - yellow tinge |
| EROLIA | 26 | | X | 3.78 | 7.1 | | |
| EROLIA | 27 | | X | 3.12 | 6.7 | | |
| EROLIA | 28 | | X | 3.15 | 7.0 | | |
| EROLIA | 29 | X | | 2.44 | 6.1 | | |
| EROLIA | 30 | | X? | 2.43 | 6.3 | | |
| EROLIA | 31 | | X | 2.24 | 6.4 | | |
| ^{EROL} S12 3A | 32 | X | | 2.82 | 6.8 | | |
| ^{EROL} S12 3A | 33 | | X | 2.44 | 6.5 | | |
| ^{EROL} S13 3A | 34 | | X | 3.06 | 6.7 | | |
| ^{EROL} S13 3A | 35 | X | | 3.29 | 7.2 | | |
| ^{EROL} S13 3A | 36 | X | | 2.99 | 6.6 | | |
| ^{Good} S16 2B | 37 | | X | 3.00 | 6.7 | | |
| ^{Good} S10 2B | 38 | | X | 7.06 | 8.6 | | |
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↳ Female or unknown

BB
Dec 2/2015

Red side shiner: ~~Fertilization~~

injections

Date:

July 11/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|-------|--------------|-----------------|-------------|------------------------------|---|
| | | Male | Female | | | | |
| LL 2A | 39 | X | | 4.78 | 7.7 | | |
| LL 2A | 40 | | X? | 3.06 | 6.7 | | |
| LL 2A | 41 | | X? | 3.21 | 6.6 | | |
| LL 2A | 42 | | X | 4.46 | 7.8 | | |
| LL 2A | 43 | | X | 5.35 | 7.8 | | |
| LL 2A | 44 | | X | 5.04 | 7.7 | | |
| LL 2A | 45 | | X | 11.57 | 8.8 | | |
| LL 2A | 46 | | X | 10.94 | 9.5 | | |
| LL 2A | 47 | | X | 12.21 | 9.9 | | |
| LL 2A | 48 | X | X | 3.93 | 7.4 | | Redness surrounding Anal pore - swollen |
| LL 2A | 49 | | X | 3.31 | 7.2 | | |
| God 2B | 50 | | X | 6.40 | 8.1 | | |
| God 2B | 51 | | X | 6.88 | 8.8 | | |
| God 2B | 52 | | X? | 3.64 | 7.1 | | |
| God 2B | 53 | | X | 4.39 | 7.2 | | |
| God 2B | 54 | X | | 6.07 | 8.6 | | |
| God 2B | 55 | | X | 4.31 | 7.2 | | |
| God 2B | 56 | | X | 5.54 | 8.2 | | |
| God 2B | 57 | X (3) | | 5.54 | 8.2 | | |
| God 2B | 58 | | X | 4.62 | 7.7 | | |
| God 2B | 59 | X | | 6.45 | 8.7 | | |
| God 2B | 60 | | X | 7.62 | 9.2 | | |

↳ Female or unknown

BP
Dec 21 2019

Red side shiner: Fertilization

Injections

Date:

July 11/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|-------------------|---------------|------|--------|-----------------|-------------|------------------------------|---|
| | | Male | Female | | | | |
| God 2A | 61 | | X | 6.92 | 8.5 | | |
| God 2A | 62 | | X | 4.12 | 7.2 | | Elongated snout, V. Streamlined - Odd looking |
| God 2A | 63 | | X | 9.41 | 9.3 | | |
| God 2A | 64 | | X | 2.36 | 8.4 | | |
| God 2A | 65 | | X | 2.82 | 7.8 | | |
| God 2A | 66 | | X | 3.40 | 8.1 | | |
| God 2A | 67 | | | | | | |
| God 2A | 68 | | | | | | |
| LL 3B | 67 | | X | 8.07 | 8.7 | | |
| LL 3B | 68 | | X | 3.87 | 7.1 | | |
| LL 3B | 69 | | X | 11.45 | 8.7 | | |
| LL 3B | 70 | | X | 5.83 | 8.2 | | |
| LL 3B | 71 | | X | 8.75 | 9.2 | | |
| LL 3B | 72 | | X | 9.21 | 9.2 | | |
| LL 3B | 73 | | X | 7.94 | 8.4 | | |
| LL 3B | 74 | | X | 15.12 | 10.7 | | |
| LL 3B | 75 | | X | 9.96 | 9.0 | | |
| LL 3B | 76 | | X | 12.68 | 10.1 | | |
| LL 3B | 77 | | X | 13.56 | 12.2 | | |
| LL 3B | 78 | | X | 8.2 | 8.6 | | |
| LL 3B | 79 | | X | 8.16 | 8.8 | | |

↳ Female or unknown

BPC
Dec 12/2019

Red side shiner: Fertilization

Injections

Date:

July 11/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|-------------|------------------------------|----------|
| | | Male | Female | | | | |
| ER023A | 80 | | X | 3.84 | 7.1 | | |
| ER023A | 81 | | X | 4.62 | 7.6 | | |
| ER023A | 82 | | X | 3.33 | 6.1 | | |
| ER023A | 83 | | X | 2.12 | 6.2 | | |
| ER023A | 84 | | X | 3.52 | 6.8 | | |
| ER023A | 85 | X | | 2.31 | 6.6 | | |
| LL S1 | 86 | | X | 11.45 | 9.9 | | |
| LL S1 | 87 | | X | 7.17 | 8.3 | | |
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↳ Female or unknown.

BR
Dec 2/2019

Red side shiner: Fertilization

Injections

Date:

July 17/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Fork Length (cm) | Used in fertilizations (Y/N) | Comments |
|------------------------|---------|------|--------------|-----------------|------------------|------------------------------|---|
| | | Male | Female | | | | |
| LL1B | 1 | | X | 15.196 | 11.1 | | Some white thin coating on back |
| LL1B | 2 | | X | 9.87 | 9.2 | | |
| LL1B | 3 | | X | 14.99 | 10.7 | | |
| LL1B | 4 | | X | 11.12 | 9.7 | | |
| LL1B | 5 | | X | 8.74 | 9.0 | | |
| LL1B | 6 | | X | 9.95 | 9.3 | | Appears the most developed - Firm stomach |
| LL1B | 7 | | X | 25.44 | 12.1 | | |
| LL1B | 8 | | X | 13.23 | 11.6 | | |
| LL1B | 9 | | X | 15.24 | 11.0 | | |
| LL1B | 10 | | X | 12.07 | 10.0 | | |
| LL1B | 11 | | X | 9.54 | 9.5 | | |
| LL54 tank | 12 | | X | 9.86 | 9.5 | | |
| LL54 tank | 13 | X | X | 13.53 | 10.4 | | |
| LL55 tank | 14 | | | 13.0 | 11.0 | | |
| LL55 Tank | 15 | X | | 7.39 | 8.4 | | |
| LL55 tank | 16 | | X | 19.14 | 11.7 | | |
| EROLIA | 17 | | X | 4.9 | 7.8 | | |
| EROLIA | 18 | | X | 4.45 | 7.7 | | |
| EROLIA | 19 | | X | 4.8 | 7.5 | | |
| EROLIA SH20 | | | | | | | |
| EROLIA SH21 | | | | | | | |

↳ Female or unknown

BRC
Dec 17/2019

Red side shiner: Fertilization

Injections

Date:

July 17/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|-------------|------------------------------|----------|
| | | Male | Female | | | | |
| LL 2A | 20 | | X | 5.23 | 7.8 | | |
| LL 2A | 21 | X? | | 4.93 | 7.4 | | |
| LL 2A | 22 | | X | 10.95 | 9.8 | | |
| LL 2A | 23 | X? | | 5.65 | 7.7 | | |
| LL 2A | 24 | X | | 12.29 | 10.1 | | |
| Good 2B | 25 | | X | 4.28 | 7.1 | | |
| Good 2B | 26 | X | | 4.81 | 7.7 | | |
| Good 2B | 27 | X | | 6.77 | 8.7 | | |
| Good 2B | 28 | X | | 4.32 | 7.5 | | |
| Good 2B | 29 | | X | 5.86 | 8.1 | | |
| Good 2B | 30 | | X | 6.27 | 8.4 | | |
| Good 2B | 31 | | X | 9.35 | 9.6 | | |
| Good 2B | 32 | X | | 5.64 | 8.1 | | |
| Good 2B | 33 | X | | 5.75 | 8.1 | | |
| Good 2B | 34 | | X | 7.94 | 8.9 | | |
| Good 2B | 35 | | X | 5.64 | 7.7 | | |
| Good 2B | 36 | | X | 5.60 | 7.7 | | |
| Good 2B | 37 | | X | 7.10 | 8.4 | | |
| Good 2B | 38 | | X | 7.15 | 8.0 | | |
| Good 2B | 39 | | X | 7.12 | 8.4 | | |
| LL 3B | 40 | | X | 10.31 | 9.8 | | |
| LL 3B | 41 | | X | 9.2 | 9.4 | | |

↳ Female or unknown

BS
Dec 12/2019

Red side shiner: Fertilization

Injection

Date:

July 17/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|-----------------|---------|------|--------|-----------------|-------------|------------------------------|----------|
| | | Male | Female | | | | |
| LL3B | 42 | | X | 15.13 | 10.9 | | |
| LL3B | 43 | X | | 8.52 | 8.6 | | |
| LL3B | 44 | | X | 13.5 | 10.1 | | |
| LL3B | 45 | | X | 7.81 | 8.9 | | |
| LL3B | 46 | | X | 8.09 | 8.9 | | |
| LL3B | 47 | X | | 7.97 | 8.5 | | |
| LL3B | 48 | | X | 9.14 | 9.2 | | |
| LL3B | 49 | | X | 5.85 | 8.6 | | |
| LL3B | 50 | | X | 9.91 | 9.3 | | |
| LL3B | 51 | | X | 12.64 | 10.4 | | |
| LL3B | 52 | | X | 13.0 | 10.0 | | |
| EROL3A | 53 | | X | 4.95 | 7.8 | | |
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↳ Female or unknown

FAU - Dec 2/2010

Red side shiner: Fertilization

Injections

Date:

July 25/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|--------------|--------------|-----------------|-------------|------------------------------|----------------------------|
| | | Male | Female | | | | |
| LL 55 | 1 | | X | 12.79 | 10.4 | | |
| LL 55 | 2 | X | | 7.51 | 8.5 | | |
| LL 55 | 3 | | X | 19.0 | 11.8 | | |
| LL 54 | 4 | | X | 9.98 | 9.5 | | |
| LL 54 | 5 | X | | 12.86 | 10.3 | | |
| LL 1B | 6 | X | | 11.76 | 10.1 | | |
| LL 1B | 7 | X | X | 9.67 | 9.2 | | |
| LL 1B | 8 | | X | 8.48 | 8.9 | | |
| LL 1B | 9 | | X | 13.07 | 10.7 | | |
| LL 1B | 10 | | X | 15.25 | 10.9 | | |
| LL 1B | 11 | X | X | 11.02 | 9.8 | | Slight Expel of Milt |
| LL 1B | 12 | | X | 8.95 | 9.0 | | |
| LL 1B | 13 | X | | 9.48 | 9.5 | | |
| LL 1B | 14 | | X | 25.52 | 12.2 | | |
| LL 1B | 15 | | X | 15.40 | 10.6 | | |
| LL 1B | 16 | | X | 15.20 | 10.7 | | |
| EROL 1A | 17 | | X | 3.85 | 7.0 | | |
| EROL 1A | 18 | | X | 4.3 | 7.3 | | |
| EROL 1A | 19 | | X | 4.7 | 7.5 | | |
| LL 2A | 20 | | X | 3.7 | 7.7 | | Some Red on Anus - Redside |
| LL 2A | 21 | | X | 4.27 | 7.6 | | |
| LL 2A | 22 | | X | 12.33 | 10.3 | | |

↳ Female or unknown

Red side shiner: ~~Fertilization~~
Injections

Date:

July 25/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|-------------|------------------------------|----------|
| | | Male | Female | | | | |
| LL2A | 23 | | X | 4.8 | 7.9 | | |
| LL2A | 24 | X | | 5.2 | 7.9 | | |
| LL2A | 25 | | X | 10.88 | 9.6 | | |
| LL2A | 26 | | X | 4.83 | 7.3 | | |
| God2B | 27 | | X | 6.63 | 8.7 | | |
| God2B | 28 | | X | 7.67 | 8.5 | | |
| God2B | 29 | | X | 5.28 | 7.8 | | |
| God2B | 30 | | X | 6.6 | 8.3 | | |
| God2B | 31 | | X | 5.64 | 8.4 | | |
| God2B | 32 | X | | 4.22 | 7.3 | | |
| God2B | 33 | | X | 8.4 | 6.4 | | |
| God2B | 34 | X | | 4.77 | 7.6 | | |
| God2B | 35 | | X | 5.53 | 8.2 | | |
| God2B | 36 | | X | 9.18 | 9.5 | | |
| God2B | 37 | | X | 5.47 | 8.2 | | |
| God2B | 38 | | X | 6.02 | 8.4 | | |
| God2B | 39 | | X | 7.08 | 8.8 | | |
| God2B | 40 | | X | 5.69 | 7.9 | | |
| LL3B | 41 | | X | 9.96 | 9.7 | | |
| LL3B | 42 | | X | 7.86 | 8.8 | | |
| LL3B | 43 | | X | 11.7 | 10.0 | | |
| LL3B | 44 | | X | 8.51 | 9.3 | | |

↳ Female or unknown

BAC
Dec 12/2019

Red side shiner: ~~Fertilization~~

injections

Date:

July 25/18

| Tank ID | Fish ID | Sex | | Body Weight (g) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|-------------|------------------------------|----------|
| | | Male | Female | | | | |
| LL3B | 45 | | X | 9.81 | 9.7 | | |
| LL3B | 46 | | X | 12.29 | 10.1 | | |
| LL3B | 47 | | X | 8.08 | 8.9 | | |
| LL3B | 48 | | X | 8.35 | 9.2 | | |
| LL3B | 49 | | X | 14.5 | 11.0 | | |
| LL3B | 50 | | X | 5.5 | 8.1 | | |
| LL3B | 51 | | X | 7.7 | 8.9 | | |
| LL3B | 52 | | X | 9.12 | 9.0 | | |
| LL3B | 53 | | X | 15.23 | 10.0 | | |
| ER02S14 | 54 | X | | 3.3 | 7.0 | | |
| ER02S14 | 55 | X | | 3.01 | 6.9 | | |
| ER02S12 | 56 | | X | 3.3 | 7.3 | | |
| ER02S12 | 57 | X | | 3.1 | 7.0 | | |
| ER02S14 | 58 | | X | 2.65 | 6.4 | | |
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↳ Female or unknown

16x

BPC
Dec 12/2019

Redside shiner: Injections

Date:

May 16/19

| Tank ID | Fish # | Sex | | | Body Weight (g) | Ovaprim Injection Volume (µL) | Removed for fertilization (Y/N) |
|---------|--------|------|--------|---------|-----------------|-------------------------------|---------------------------------|
| | | Male | Female | Unknown | | | |
| 1A | 1 | X | | | 4.1 | 82 | |
| | 2 | | X | | 4.6 | 92 | |
| | 3 | | X | | 5.5 | 110 | |
| | 4 | X | | | 4.3 | 86 | |
| | 5 | | X | | 6.2 | 124 | |
| 1B | 1 | | X | | 20.8 | 416 | |
| | 2 | X | | | 9.1 | 182 | |
| | 3 | | X | | 14.3 | 286 | |
| | 4 | | X | | 13.6 | 272 | |
| | 5 | | X | | 11.7 | 236 | |
| | 6 | | X | | 9.4 | 188 | |
| | 7 | | X | | 9.2 | 184 | |
| 2A | 1 | | X | | 13.1 | 262 | |
| | 2 | | X | | 13.4 | 270 | |
| | 3 | X | | | 10.8 | 216 | |
| | 4 | | X | | 5.1 | 102 | |
| | 5 | | X | | 4.9 | 100 | |
| | 6 | | X | | 5.2 | 104 | |
| 2B | 1 | X | | | 7.1 | 142 | |
| | 2 | | X | | 8.3 | 166 | |
| | 3 | X | | | 6.5 | 130 | |
| | 4 | | X | | 9.3 | 186 | |

↳ Female or unknown

BSL
Dec 12/2019

Redside shiner: Injections

Date: May 16/2019

| Tank ID | Fish # | Sex | | | Body Weight (g) | Ovaprim Injection Volume (µL) | Removed for fertilization (Y/N) | |
|---------|--------|------|--------|---------|-----------------|-------------------------------|---------------------------------|--|
| | | Male | Female | Unknown | | | | |
| 7B | 5 | | X | | 8.2 | 164 | | |
| | 6 | | X | | 7.4 | 148 | | |
| | 7 | | X | | 5.6 | 112 | | |
| | 8 | X | | | 6.1 | 122 | | |
| | 9 | | X | | 5.2 | 104 | | |
| | 10 | X | | | 6.2 | 124 | | |
| | 3A | 1 | | X | | 8.5 | 170 | |
| | | 2 | | X | | 13.8 | 276 | |
| | | 3 | | X | | 14.9 | 298 | |
| | | 4 | | X | | 13.6 | 272 | |
| 5 | | | X | | 10.0 | 200 | | |
| 3B | 1 | | X | | 10.7 | 214 | | |
| | 2 | | X | | 10.6 | 212 | | |
| | 3 | | X | | 8.2 | 164 | | |
| | 4 | | X | | 5.1 | 102 | | |
| | 5 | | X | | 8.4 | 168 | | |
| | 6 | | X | | 13.1 | 270 | | |
| | 7 | | X | | 8.1 | 162 | | |
| | 8 | X | | | 10.6 | 212 | | |
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↳ Female or unknown.

137 L
Dec 21/2019

Red side shiner: Fertilization

Injections

Date: June 21/19

| Tank ID | Fish ID | Sex | | Body Weight (g) | Volume ^{µL} length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|----------------------------------|------------------------------|----------|
| | | Male | Female | | | | |
| 1A | 1 | | X | 2.9 | 60 | | |
| | 2 | | X | 5.5 | 110 | | |
| | 3 | | X | 3.8 | 80 | | |
| | 4 | | X | 6.2 | 124 | | |
| | 5 | X? | | 3.3 | 78 | | |
| | 6 | | X | 3.5 | 70 | | |
| | 7 | | X | 2.6 | 50 | | |
| | 8 | X | | 3.4 | 70 | | |
| | 9 | X | | 5.2 | 104 | | |
| | 10 | | X | 4.0 | 80 | | |
| | 11 | | X | 4.6 | 92 | | |
| | 12 | X | | 4.6 | 92 | | |
| 1B | 1 | | X | 9.6 | 192 | | |
| | 2 | | X | 9.0 | 180 | | |
| | 3 | | X | 18.9 | 380 | | |
| | 4 | | X | 11.8 | 236 | | |
| | 5 | | X | 7.8 | 156 | | |
| | 6 | | X | 17.6 | 252 | | |
| | 7 | | X | 14.2 | 284 | | |
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↳ Female or unknown

Dec 21/2019
10/19

Red side shiner: Fertilization

Injections

Date: June 21/19

Date:

| Tank ID | Fish ID | Sex | | Body Weight (g) | Volume (pl) Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|----------------------------|------------------------------|-------------|
| | | Male | Female | | | | |
| 2A | 1 | | X | 10.4 | 208 | | |
| | 2 | | X | 5.2 | 104 | | |
| | 3 | | X | 12.7 | 254 | | |
| | 4 | | X | 5.4 | 106 | | |
| | 5 | | X | 12.9 | 258 | | |
| 2B | 1 | | X | 4.6 | 96 | | |
| | 2 | | X | 6.7 | 134 | | |
| | 3 | | X | 6.6 | 132 | | |
| | 4 | | X | 6.5 | 130 | | |
| | 5 | | X | 5.7 | 110 | | |
| 3A | 6 | | X | 6.0 | 116 | | |
| | 7 | | X | 4.3 | 86 | | |
| | 8 | | X | 3.6 | 72 | | |
| | 1 | | X | 14.3 | 286 | | |
| | 2 | | X | 8.3 | 166 | | |
| | 3 | | X | 9.8 | 196 | | |
| | 4 | | X | 16.5 | 326 | | |
| | 5 | | X | 10.3 | 206 | | M.H Exposed |
| 3B | 1 | X | | 8.7 | 174 | | |
| | 2 | X | | 9.8 | 196 | | |
| | 3 | X | | 11.0 | 220 | | |
| | 4 | X | | 13.4 | 268 | | |
| | 5 | X | | | | | |

↳ Female or unknown

Dec-22/2019

Red side shiner: Fertilization
Injections

Date: June 21/19

Date: _____

| Tank ID | Fish ID | Sex | | Body Weight (g) | Volume (µL) | Length (cm) | Used in fertilizations (Y/N) | Comments |
|---------|---------|------|--------|-----------------|-------------|-------------|------------------------------|----------|
| | | Male | Female | | | | | |
| 38 | G | | X | 8.1 | 162 | | | |
| | F | | X | 7.5 | 150 | | | |
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no female or unknown

BS-06212019

Redside shiner: Injections

Date:

June 27/19

| Tank ID | Fish # | Sex | | | Body Weight (g) | → see separate sheet | |
|---------|--------|--------|--------|---------|-----------------|---------------------------------|---------------------------------|
| | | Male | Female | Unknown | | Ovaprim Injection Volume (μL) | Removed for fertilization (Y/N) |
| 1A | 1 | | | ✓ | 4.4 | | |
| | 2 | ✓ milt | | | 3.3 | | |
| | 3 | | | ✓ | 3.7 | | |
| | 4 | | | ✓ | 5.0 | | |
| | 5 | ✓ milt | | | 4.2 | | |
| | 6 | | | ✓ | 3.7 | | |
| | 7 | | | | 3.3 | | |
| | 8 | | | | 3.1 | | |
| | 9 | | ✓ | | 5.7 | | |
| | 10 | | | ✓ | 3.1 | | |
| 1B | 1 | | | ✓ | 8.4 | | |
| | 2 | ✓ | | | 9.1 | | |
| | 3 | | | ✓ | 18.2 | | |
| | 4 | | | | 10.7 | | |
| | 5 | | | | 12.2 | | |
| | 6 | | | | 7.7 | | |
| | 7 | | | | 13.7 | | |
| 2A | 1 | | | | 10.3 | | |
| | 2 | | ✓ | | 13.4 | | |
| | 3 | | | ✓ | 11.5 | | |
| | 4 | | | ✓ | 5.1 | | |

Dec 2
2019
BP

Redside shiner: Injections

| Redside shiner: Injections | | | | | | | |
|----------------------------|------------|--------|--------|---------|-----------------|--|--|
| Date: | June 27/19 | | | | | | |
| Tank ID | Fish # | Sex | | | Body Weight (g) | <i>see volume sheet</i> | |
| | | Male | Female | Unknown | | Ovaprim Injection Volume (µL) | Removed for fertilization (Y/N) |
| 2B | 1 | | | ✓ | 6.9 | | |
| | 2 | ✓ milk | | | 6.9 | | |
| | 3 | | | ✓ | 3.8 | | |
| | 4 | | | | 5.7 | | |
| | 5 | | | | 4.1 | | |
| | 6 | | | | 5.9 | | |
| | 7 | | | | 4.6 | | |
| | 8 | | | | 5.6 | | |
| 3A | 1 | | | | 8.8 | | |
| | 2 | | | | 13.8 | | |
| | 3 | | | | 10.4 | | |
| | 4 | | | | 14.0 | | |
| 3B | 1 | | | | 10.9 | | |
| | 2 | | | | 10.4 | | |
| | 3 | | | | 7.8 | | |
| | 4 | | | | 7.3 | | |
| | 5 | | | | 12.3 | | |
| | 6 | | | | 7.9 | | |
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B8
Dec 2/2019

Redside shiner: Injections

Date:

July 4/19

| Tank ID | Fish # | Sex | | | Body Weight (g) | see volume sheet | |
|---------|--------|-------|--------|---------|-----------------|-------------------------------|---------------------------------|
| | | Male | Female | Unknown | | Ovaprim Injection Volume (μL) | Removed for fertilization (Y/N) |
| 1A | 1 | | | ✓ | 5.4 | | |
| | 2 | | | | 3.5 | | |
| | 3 | | | | 3.0 | | |
| | 4 | | | | 4.8 | | |
| | 5 | | | ↓ | 4.0 | | |
| | 6 | ✓milt | | | 4.4 | | |
| | 7 | | | ✓ | 4.0 | | |
| | 8 | ✓milt | | | 3.2 | | |
| | 9 | | | ✓ | 3.0 | | |
| 1B | 1 | | | | 8.9 | | |
| | 2 | | | | 17.7 | | |
| | 3 | ✓milt | | | 9.9 | | |
| | 4 | | | ✓ | 14.0 | | |
| | 5 | ✓ | | ✗ | 12.4 | | |
| | 6 | ✓milt | | ✓ | 11.0 | | |
| 2A | 1 | | | | 7.7 | | |
| | 2 | | | | 10.1 | | |
| | 3 | | | | 13.1 | | |
| | 4 | | | | 12.8 | | |
| | 5 | | | | 3.5 | | |
| 2B | 1 | | | | 6.1 | | |
| | 2 | | | | 4.4 | | |
| | 3 | | | | 6.4 | | |
| | 4 | ✓milt | | | 4.6 | | |
| | 5 | | | ✓ | 5.0 | | |
| | 6 | | | | 7.0 | | |
| | 7 | | | | 6.1 | | |
| | 8 | | | | 5.6 | | |
| 3A | 1 | | | | 13.3 | | |
| | 2 | | | | 14.0 | | |
| | 3 | | | | 9.2 | | |
| | 4 | | | | 8.8 | | |

BP
Dec 2
2019

Redside shiner: Injections

Date: July 4/19

| Tank ID | Fish # | Sex | | | Body Weight (g) | See volume sheet | |
|---------|--------|------|--------|---------|-----------------|-------------------------------|---------------------------------|
| | | Male | Female | Unknown | | Ovaprim Injection Volume (µL) | Removed for fertilization (Y/N) |
| 3B | 1 | | | ✓ | 10.8 | | |
| | 2 | | | | 9.5 | | |
| | 3 | | | | 11.2 | | |
| | 4 | | | | 7.1 | | |
| | 5 | | | | 9.8 | | |
| | 6 | | | | | 8.2 | |
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BP
Dec 2/2019

Redside shiner: Dissections

Termination

Date: July 25/19

Date:

| Tank ID | Fish # | Sex | Length (cm) mm | Weights | | | | Liver Weight (g) | Comments |
|----------|--------|-----|-------------------|-----------------|---------------------|------------------|------------------|------------------|----------|
| | | | | Body Weight (g) | Muscle Weight mg | Gonad Weight (g) | Liver Weight (g) | | |
| 1A | 1 | M | 71.8 | 3.9 | 447.42 | | | | |
| | 2 | F | 75.3 | 5.3 | 940.13 | | | | |
| | 3 | F | 65.0 | 3.0 | 278.52 | | | | |
| | 4 | M | 67.5 | 3.1 | 631.46 | | | | |
| | 5 | M | 62.8 | 2.7 | 165.16 | | | | |
| | 6 | M | 64.6 | 3.0 | 473.45 | | | | |
| | 7 | M | 59.4 | 2.1 | 138.63 | | | | |
| | 8 | F | 66.6 | 3.1 | 537.98 | | | | |
| | 9 | M | 67.9 | 3.2 | 246.12 | | | | |
| | 10 | M? | 60.9 | 2.4 | 418.65 | | | | |
| | 11 | M | 73.7 | 4.4 | 277.66 | | | | |
| | 12 | F | 77.5 | 4.4 | 824.05 | | | | |
| | 13 | F | 62.6 | 2.8 | 481.31 | | | | |
| | 14 | M | 62.2 | 2.5 | 431.80 | | | | |
| | 15 | M | 55.9 | 2.1 | 305.83 | | | | |
| | 16 | M | 60.5 | 3.7 | 735.20 | | | | |
| | 17 | M | 58.2 | 1.8 | 275.19 | | | | |
| Tanks 1B | 1 | F | 99.2 | 10.2 | 2074.40 | | | | |
| | 2 | M | 87.9 | 9.1 | 1703.22 | | | | |
| | 3 | F | 115.1 | 17.0 | 3226.51 | | | | |
| | 4 | M | 100.9 | 12.0 | 1763.12 | | | | |
| | 5 | M | 88.9 | 8.9 | 1663.70 | | | | |

10/22/19
10/22/19

Redside shiner: Dissections

Termination

Date:

July 25/19

| Tank ID | Fish # | Sex | Length (cm) mm | Weights | | | | Comments |
|---------|--------|-----|----------------------|--------------------|----------------------|---------------------|---------------------|--------------|
| | | | | Body Weight (g) | Muscle Weight (g) | Gonad Weight (g) | Liver Weight (g) | |
| Tank 1B | 6 | F | 97.3 | 12.9 | 2079.12 | | ✓ | |
| Tank 2A | 1 | M | 92.4 | 9.4 | 1258.22 | | | |
| | 2 | F | 104.2 | 11.7 | 1917.37 | | | |
| | 3 | F | 102.3 | 12.2 | 2010.33 | | | |
| | 4 | F | 88.2 | 7.6 | 1038.04 | | | |
| | 5 | F | 77.5 | 5.4 | 1027.55 | | | |
| | 6 | M | 69.6 | 3.6 | 608.39 | | | |
| Tank 2B | 1 | F | 84.1 | 5.9 | 870.33 | | | |
| | 2 | F | 87.0 | 4.9 | 676.49 | | | |
| | 3 | M | 82.6 | 5.8 | 632.97 | | | |
| | 4 | M | 84.6 | 5.9 | 1159.82 | | | |
| | 5 | F | 75.4 | 5.1 | 986.44 | | | |
| | 6 | M | 75.9 | 3.6 | 575.61 | | | |
| | 7 | F | 78.4 | 5.2 | 937.55 | | | |
| | 8 | M | 73.5 | 4.6 | 764.18 | | | Pike Marrow? |
| Tank 3A | 1 | F | 97.8 | 8.6 | 915.73 | | | |
| | 2 | F | 98.7 | 10.7 | 1850.27 | | | |
| | 3 | F | 107.7 | 13.5 | 2055.39 | | | |
| Tank 3B | 1 | F | 86.1 | 7.7 | 1127.94 | | | |
| | 2 | F | 100.0 | 11.0 | 1775.29 | | | |
| | 3 | F | 88.3 | 7.1 | 1070.99 | | | |
| | 4 | F | 91.5 | 7.8 | 1370.44 | | | |

2019
Kestel
10/25

Redside shiner: Dissections
Termination.

Date: July 25/19

| Tank ID | Fish # | Sex | Length (cm) mm | Weights | | | | | Comments |
|---------|--------|-----|----------------------|--------------------|----------------------|---------------------|---------------------|--|----------|
| | | | | Body Weight (g) | Muscle Weight (g) | Gonad Weight (g) | Liver Weight (g) | | |
| Tank 3B | 5 | F | 91.6 | 9.4 | 1519.05 | | | | |
| | 6 | M | 91.1 | 8.8 | 1591.22 | | | | |
| | 7 | M | 86.5 | 7.7 | 1375.79 | | | | |
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See page 12/20/19

APPENDIX B

**Fishing Summary from
Previous Years**

APPENDIX B
Fishing Summary from Previous Years

Table B.1: Summary of Recent Redside Shiner (RSC) Lentic Area Fishing and Supporting Data

| Year | Season | Type | Area | Area Code | Approximate UTM (NAD83, 11U) | | Date | Fishing Method | Catch | CPUE | CPUE Units | In situ Specific Conductance (2018) ^a | Selenium Concentrations | | | 2019 Selection Recommendations | | |
|------------------|--------|-----------|----------------|-----------------------------------|-------------------------------|-----------|-------------|----------------|-------------|-----------|----------------------|--|---------------------------------|------------------------------|---|---|-----------------|---|
| | | | | | Easting | Northing | | | | | | | Total Water (2018) ^a | Sediment (2018) ^b | Benthic Invertebrate Tissue (2018) ^b | | | |
| | | | | | | | | | | | | | | | | | (µS/cm) | (mg/L) |
| 2015 and earlier | Spring | Exposed | Elko Reservoir | RG_ELKO-L | 637546 | 5462281 | 3-May-11 | Dip net | 6 | nc | nc | 438 ^d | 0.0089 ^c | 1.2 ^c | 10 ^c | Not recommended. Highly visible to public and fishing areas are heavily travelled by public. Not entirely lentic. | | |
| | | | Stanford Pond | RG_STPD | 639864 | 5483139 | 9-May-15 | Minnow Trap | 2 | 0.0038 | Catch/day | 307 | 0.0044 | 10 | 14 | Recommended with caution and preference to other areas. Highly visible to public and loss is possible. | | |
| | | 10-May-15 | | | | | Minnow Trap | 1 | 0.0019 | Catch/day | | | | | | | | |
| | | 11-May-15 | | | | | Minnow Trap | 1 | 0.0018 | Catch/day | | | | | | | | |
| | | | | | | | | 17-Sep-15 | Minnow Trap | 1 | 0.0019 | Catch/day | | | | | | |
| | | | | | | 16-Sep-15 | Minnow Trap | 1 | 0.0018 | Catch/day | | | | | | | | |
| 2018 | Spring | Reference | Loon Lake | RG_LNLK | 638220 | 5441850 | 3-May-18 | Seine | 1,000 | 6.7 | Catch/m ² | 251 | <0.000050 | - | - | Recommended | | |
| | | | | | | | 5-May-18 | Seine | 500 | 3.3 | Catch/m ² | | | | | | | |
| | | | | | | | 3-May-18 | Gill net | 30 | 72 | Catch/hour | | | | | | | |
| | | | | Exposed | Koochanusa - Elk River Mouth | RG_ER | 627997 | 5447625 | Late Apr | Hoop Net | 14 | 1.7 | Catch/day | 302 | 0.0012 | 0.67 | 7.7 | Recommended |
| | | | Gill Net | | | | | | 97 | 15 | Catch/hour | | | | | | | |
| | | | | | Koochanusa - Gold Creek Mouth | RG_GC | 630804 | 5436413 | Late Apr | Hoop Net | 0 | 0 | Catch/day | 264 | 0.0018 | 0.35 | 3.0 | Recommended |
| | | | | | | Gill Net | 112 | 36 | Catch/hour | | | | | | | | | |
| | | | | | Michel Creek Wetland | RG_MIC2 | 659520 | 5496610 | 5-May-18 | Seine | 0 | 0 | Catch/m ² | 418 ^d | 0.0013 ^d | 1.9 ^d | 10 ^d | Not recommended. Although RSC have been found here in the past, nothing was caught in 2018. |
| | | | | | Elk River Oxbow | RG_EROL | 640831 | 5478206 | 4-May-18 | Hoop Net | 24 | 33 | Catch/day | 375 | 0.0013 | 4.4 | 12 | Recommended |
| | | | 5-May-18 | Hoop Net | | | | | 7 | 5.1 | Catch/day | | | | | | | |
| | | | 6-May-18 | Hoop Net | | | | | 22 | 35 | Catch/day | | | | | | | |
| | | | | Goddard Marsh | RG_GO13 | 652955 | 5514065 | 2-May-18 | Seine | 1 | 0.0067 | Catch/m ² | 790 | 0.040 | 25 | 26 | Recommended | |
| | | | 2-May-18 | | | | | Hoop Net | 9 | 5.1 | Catch/day | | | | | | | |
| | | | 4-May-18 | | | | | Hoop Net | 4 | 2.0 | Catch/day | | | | | | | |
| | | | 6-May-18 | | | | | Hoop Net | 8 | 4.1 | Catch/day | | | | | | | |
| | | | 2-May-18 | | | | | Minnow Trap | 1 | 0.037 | Catch/day | | | | | | | |
| | | Summer | Reference | Grave Lake | RG_GRLK | 655563 | 5525690 | 5-Aug-18 | Seine | 22 | nc | Catch/m ² | 289 | 0.00032 | 2.9 ^e | 3.7 | Recommended | |
| | | | | | | | | 5-Aug-18 | Minnow Trap | 169 | 256 | Catch/day | | | | | | |
| | | | Exposed | Elk River Impoundment in Fernie | RG_ERIMF | 640447 | 5486898 | 3-Aug-18 | Seine | 115 | nc | Catch/m ² | 284 | 0.000091 | 0.68 | 2.7 | Recommended | |
| | | | | Elk River Wetland South of Fernie | RG_ERWSF | 639138 | 5484622 | 2-Sep-18 | Minnow Trap | 12 | 1.3 | Catch/day | 471 | 0.0004 | 1.4 | 3.2 | Recommended | |
| | | | | Elk River Wetland d/s Grave Creek | RG_ELWDGC | 653175 | 5521300 | 6-Aug-18 | Seine | 15 | 0.030 | Catch/m ² | 459 | 0.0073 | 6.6 | 24 | Recommended | |
| | | | | Elk River Oxbow | RG_EROL | 640831 | 5478206 | 31-Jul-18 | Minnow Trap | 16 | 0.94 | Catch/day | 481 | 0.00013 | 4.4 | 12 | Recommended | |
| | | | | | | | | 31-Jul-18 | Hoop Net | 40 | 1.4 | Catch/day | | | | | | |
| | | | | Goddard Marsh | RG_GO13 | 652955 | 5514065 | 2-Aug-18 | Seine | 1 | 0.0020 | Catch/m ² | 960 | 0.082 ^f | 25 | 26 | Recommended | |

Notes: 2018 data collected during the Lentic Area Supporting Study or the Pilot Reproductive Toxicity Study for Redside Shiner; nc = not calculated; dw = dry weight

^a Spot water samples collected within 1 week of 2018 fishing date unless otherwise noted.

^b Mean 2018 concentrations unless otherwise noted.

^c Data reported for 2015 in nearby area RG_ELKO (Minnow 2018a).

^d Data reported for 2015 (Minnow 2018a).

^e Data reported for 2013 (Minnow 2018a).

^f Low concentration of spot sample (0.00041 mg/L) was considered suspect, and August 2018 sample for EV_GC2 is reported.

APPENDIX C

Standard Operating Procedure



Standard Operating Procedure

The Collection of Ripe Redside Shiner for Use in Toxicological Experiment

Prepared by:
Minnow Environmental Inc.
Georgetown, Ontario

April 2019

1 INTRODUCTION

The objective of this SOP is to outline the methods for collection of redbside shiner in order to extract ripe eggs and milt for a toxicology study. Minnow will be responsible for the collection of fish, the determination of ripeness and tissue sampling. Once the fish have been collected, Nautilus will be responsible for the expression of ripe eggs and milt, fertilization, transport to the laboratory and rearing to hatch.

Prior to fishing for redbside shiner, crews will map the aquatic habitat for likely spawning locations within each lentic area. Based on the available literature, we have determined that the fish require at least 10-12 °C water temperature to begin preparing to spawn. The fish also require suitable flowing water, be that from an inflow, outflow or spring. Ideal spawning habitat has been described as a moving water sections followed by a still water pool downstream. Examples of this include a riffle-pool creek system or a tributary and the lentic area it drains into. The fish will congregate in the pool, prior to spawning in smaller groups in the riffle section. Crews must target these features when setting fishing gear to maximize the efficiency of the program. The information to make this decision will be recorded on the site selection field sheet. Every lentic area to be fished also requires a water sample to be collected once a week (with accompanying quality assurance/quality control – QA/QC - samples).

The three types of gear will be used for fishing in this program, including: 1) hoop nets; 2) seine nets; and 3) minnow traps (see section 14 for representative diagrams). Hoop nets are a passive fish capture technique, relying on fish to willingly encounter and enter the net. They are a type of cylindrical fish trap with a series of funnel-shaped openings which make it easy for fish to enter the trap, but very difficult for them to escape. Hoop nets have one lead and two wings that extend from the mouth of the net to guide fish into the trap. They can be used to sample fish in a wide range of environments, including lakes, wetlands, and rivers. Nets will be set in pool or slow flowing areas, with the opening angled towards a riffle, where possible. Hoop netting is considered a non-lethal approach to collecting fish. Hoop nets will be set overnight for fish capture.

Seining is widely used as a method for collecting fish in streams, rivers, and lakes. Seining for this program will be conducted by foot in the pools of shallow water near potential spawning riffles. A seine can be variable in size, but a standard size is 15 m (50 feet) by 0.9 m (3 feet) with a mesh size of 0.3 cm. Seine nets have a lead line along the bottom of the net and a float-line along the top of the net. While in use, these lines ensure that the net stretches vertically in the water column. The lead line must remain in contact with the substrate (when seining by foot) and the float-line must be at the surface in order to prevent fish from escaping. Seining is generally most effective



at capturing small-bodied fish in shallow littoral habitat. Seines will be used whenever possible in areas without excessive large woody debris or rocks that would influence the effectiveness of the technique, or risk damage to the net itself. Seining will be the only form of active fishing for this project.

Minnow traps are portable cages that capture fish as they swim through small funnel-shaped openings at each end. Minnow traps work best to catch small-bodied fish as traps are typically 42 cm long, 25 cm deep, have 0.6 cm mesh, and have 2.5 cm diameter openings. Minnow traps will be deployed in conjunction with the other fishing methods to maximize potential to catch fish.



2 FISHING SITE SELECTION

Fishing site selection at each lentic area will be carried out as follows:

1. Conduct habitat mapping of the lentic area, and identify inflows, outflows, and ideal spawning habitat. Record the GPS coordinates of these features on field sheets. Take photos of the site and unique/ distinguishing habitat features.
2. Indicate the following on field sheets:
 - a. Size of assessed habitat;
 - b. Average depth (in meters);
 - c. Amount and type of vegetation present (aquatic, riparian, and overhanging canopy);
 - d. Anthropogenic influences;
 - e. Substrate type; and
 - f. Submerged cover (i.e., large woody debris, reeds, boulders, etc.);
3. Complete a drawing of the site and include:
 - a. The inflowing riffle and stillwater pool sections (if present);
 - b. General flow direction;
 - c. Unique point features (large rocks, submerged trees, etc.);
 - d. Observations of fish (RSC or other species); and
 - e. Fish behavior (e.g., spawning behavior);
4. Measure water temperature and other supporting measures (pH, dissolved oxygen, specific conductivity) at the inflows and outflows where RSC are expected to spawn, and record on field sheets;
5. Set fishing gear at locations likely to catch ripe fish (i.e., near inflows or where RSC are exhibiting spawning behavior), and indicate set locations on field maps. Follow SOPs for fishing (see below);
6. Record additional notes that may include pertinent information for other crews. Several crews may visit each site and information that can be shared will be helpful to the project.



3 WATER SAMPLE COLLECTION

One grab sample will be collected at each lentic area weekly during the program. Samples will not be filtered in the field. General guidelines for grab sampling are as follows:

1. Only use sample bottles provided by the analytical laboratory specific for each analysis. Reject any uncapped bottles.
2. If the sample bottle has been pre-preserved, then use a second bottle that does not contain preservative to fill the pre-preserved sample bottle.
3. Ensure bottles remain capped until sample collection and are stored under clean conditions (e.g., in cooler, plastic bag, etc.). Keep vehicles reasonably clean to limit potential contaminant sources.
4. Do not rinse bottles that are supplied clean by the laboratory.
5. Only leave the sample bottle uncapped while filling the bottle and/or adding preservatives. Do not touch the cap liner or the inside of the sampling bottles (even when wearing gloves). When sampling, store caps in a plastic bag or set inverted on a clean surface.
6. Gloves must be worn, use un-powdered latex, nitrile, or polyethylene disposable gloves and refrain from smoking or eating. An acceptable pair of gloves are included with the sample kits received from the laboratory. Do not use insect repellent, sunscreen or moisturizers if sampling by hand or be very careful that repellents, sunscreen, or moisturizers do not come into contact with the samples.
7. While sampling, avoid submerged vegetation and ensure sample is free of obvious foreign material not representative of the water column at time of sampling (e.g., algae, sediment, organic matter, etc.).

Collect an unfiltered grab sample as follows:

1. Grasp the bottle well below the neck and remove the lid, taking care not to touch the inside of the lid;
2. Collect water chemistry samples by wading into the water from shore and taking a grab sample from approximately mid-depth, or at arm's length below the surface. If the water is shallow, avoid disturbing the bottom substrate while wading into the water body or when submerging the bottle;
3. Once the bottle is full, remove the bottle from the water in one motion by forcing the opening away from you. If the sample does not require preservation, fill it to the top to



minimize air space. If preservation is required, fill only to the “fill line” indicated on the bottle, or ensure enough space remains for addition of the preservative (refer to Analytical lab instructions).

4. Return to shore, add the preservative if required and replace cap. Gently invert the bottle two or three times to mix with preservative.



4 SETTING A HOOP NET

To set up and use a hoop net, proceed as follows:

1. Nets can be placed facing any direction, but a general procedure is to set the net perpendicular to shore with the lead running to shore.
2. Secure one end of the lead, either by tying it to shore or by tying an anchor (e.g., weight and reusable bag) to the lead line and a float to the float line.
3. If using a boat to set the net, reverse the boat slowly while deploying the lead of the hoop net. If deploying without a boat, slowly wade away from the secured lead end. Once at the end of the lead, tie the float line of the lead to the top and middle of the square opening of the net and the lead-line to the bottom-middle of the square.
4. At the end of each wing, add a rope and float (that will reach the water surface when the net is submerged) to the float line and an anchor to the lead line. Tie a “SCIENCE EXPERIMENT” label to the float line that is visible from the surface.
5. Lower the wings into the water on either side of the lead ensuring that the wings are vertical and not twisted; the float line must be at the top and the lead line on the bottom.
6. Continue reversing or wading backwards and slowly lower the square end of the hoop net into the water followed by all the hoops of the net. Ensure that the hoop net is completely stretched out, taut, and not twisted.
7. To close the cod-end of the net, confirm that the line that extends from the last funnel of the hoop net exits through the cod-end of the net. The cod-end is then tied securely by using the small rope that is tied to the hoop net mesh at the cod-end. Poorly secured cod-ends can allow fish to escape.
8. Secure an anchor to the rope that extends through the cod-end. Tie a float and rope to the cod-end, so that the float will reach the surface once the net is submerged.
9. Slowly lower the anchor into the water, and as the net sinks, hold the float line to ensure the net remains taut.
10. Return to the floats tied to the wings and pull the wings lightly at a 45 degree angle from the lead to ensure that each wing is stretched out. It may be necessary to return to the cod-end float and pull it taut as well, as setting the wings may have displaced the net.
11. Leave the net in place overnight, including both dusk and dawn periods when fish movement is greatest.



12. Check nets daily. If nets are left for longer than a day, fish may become injured trying to escape, or larger predators caught in the net may consume smaller fish.

Retrieve the hoop net as follows:

1. Fill a tote with water; this will be used to hold the fish caught in the net.
2. Grab the lead, and follow it to the opening of the net.
3. When the opening is reached, pull it to the surface using a slight shaking motion to ensure that any fish caught between the hoops nearest the opening are funnelled to the cod-end of the net.
4. Continue to pull the hoops from the water until the entire hoop net is out of the water, retrieve the anchor secured to the cod-end, untie the cod-end, and empty the contents of the net into the water-filled tote.
5. Upon retrieval of the net, record the date and time on field sheets.
6. Identify and enumerate all fish. Retain all redbreast shiners in an aerated bucket, and otherwise release remaining fish as close to the point of capture as possible.



5 SEINE HAULING BY FOOT

A seine net is hauled by foot using two operators, as follows:

1. First, pull the seine net out of its storage tote and ensure that there are no twists in the net and that the float line is on top.
2. Fill a tote with water; this will be used later to hold the fish for processing.
3. Have each operator grab separate ends of the seine by the wings. The end of each wing has a handle loop at the top on the float-line and a foot loop on the lead-line. Put one foot through the lead-line loop and hold on to the float-line loop so that you can walk forward on the outside of the seine, without obstructing the pathway to the seine bag.
4. Seining can be conducted either by walking over a larger area along the shore, or by encompassing a relatively small area.
5. To use the technique of walking over a larger area, begin at the shore. Have one operator walk out perpendicular to the shore as far as possible and then walk parallel to the shoreline while the other operator walks along the edge of the waterbody. If seining in a flowing area, begin at the downstream end and move in an upstream direction.
6. Alternatively, sample a more localized area by having one crew member remain stationary on shore with one wing of the seine, while the other crew member walks out and back towards shore, completing a semi-circle.
7. Once the desired distance has been walked, return to shore. Lay the wings out flat such that the lead lines meet and the float lines are on the outside. Both operators must retrieve the net at the same pace, so that the seine bag remains at the furthest point from the operators. While pulling the net in, have the lead-lines drag together along the bottom and the float-lines remain at the surface in order to minimize gaps where fish could escape.
8. As the net is being pulled in, shake the wings so that all fish are pooled in the seine bag at the end of the seine.
9. Once the net is completely pulled onto shore, empty the fish from the seine bag into the water-filled tote.
10. Inspect the seine for any remaining fish.
11. Record the total area covered by each seine haul, as well as the maximum depth. This information is required for calculating the catch-per-unit-effort (CPUE).



12. Identify and enumerate all fish. Retain all redbreast shiners in an aerated bucket, and otherwise release remaining fish as close to the point of capture as possible.

Seines can be torn as they are pulled through the water, leaving holes through which fish can escape. Inspect the seine frequently, and repair as necessary.



6 SETTING A MINNOW TRAP

1. Traps are typically baited to attract fish. Place bait (dry cat food or other) into a screened (no greater than 1 mm mesh) 250 mL container or in cheese cloth tied tightly with string or a cable tie. The container or cheese cloth ensures that the fish cannot eat the food, which could potentially alter their weight and skew measurements. Record the type of bait used.
2. Once the bait is prepared, place the bait into one of the baskets and close the large openings together so that the each pin goes through a hoop.
3. Close the trap with a clip by attaching it onto the aligned open hoops (on the opposite side from the matched pins and hoops).
4. Tie a rope and float to the ring end of the clip, and tie a “SCIENCE EXPERIMENT” label to the end. There must be enough rope for the float to reach to the surface when the trap is sitting on the substrate.
5. After a set amount of time (e.g., 24 hours), retrieve the trap and record the time and date on field sheets. If necessary, minnow traps can be left in the water for a few days, as they allow the fish to remain alive and in good condition.
6. Remove the clip to open the trap and empty the fish into a clean pail of water.
7. Identify and enumerate all fish. Retain redbreast shiners in an aerated bucket, and otherwise release remaining fish as close to the point of capture as possible.



7 IDENTIFICATION OF RIPE INDIVIDUALS

To identify a ripe male redbside shiner:

- a. The pectoral fin should extend past the pelvic fins (Used to initially sex fish)
- b. The fins should be brassy in colour. Dark colouration nearest to the insertion point but continuing down the fin, almost appear opaque in portions. There should also be a brassy half-moon under the eye. Yellow between the dark back and lateral band colour. Bright, wide red stripe extending to the anal fin.
- c. Nuptial tubercle (small white ridges or bumps) may be present on the head. This is a strong indication that a male is ready to spawn.
- d. Gently squeeze the abdomen to see if a small amount of white milt is produced. If so, the male is ready for extraction. If no milt is produced, release the fish back into the water body.

To identify a ready to spawn female redbside shiner:

- a. The pectoral fin will not extend past the pelvic fins.
- b. Fins are pale in comparison to the males, and remain transparent. The half-moon under the eye is gold in colour and the colouration along the body is more subtle, described as golden.
- c. Feel the abdomen of the female fish. If the body feels hard and no apparent movement beneath the skin, the fish is not ready to spawn. If the body has some give to it and you can feel movement below the skin, the fish is still preparing to spawn. When fish are in this stage or later, be very careful not to express more than one or two eggs. If you see eggs coming out of the fish while feeling the abdomen, the fish is ready to spawn and the crew from Nautilus should be contacted immediately.

Care should always be taken when handling redbside shiners, as a ripe and running female can express her eggs through very light pressure on the body. All fish determined to be ready for spawning should be set aside in buckets containing water, separated by sex.

When spawning characteristics appear in fish in an area, notify Nautilus so that crews can be deployed to assist in the extraction and fertilization of eggs.



8 FISH SAMPLE COLLECTION SEQUENCE

Once ripe and ready RSC are caught, samples will be collected in the following sequence (refer to the following sections for detailed instructions for each step):

1. Anaesthetize or euthanize ripe fish using clove oil (See Sections 9 and 10).
2. A photo will be taken of each fish and meristic data will be collected:
 - a. Fork length, total length, body weight
3. Nautilus staff will strip ripe eggs from spawning individuals and collect them in a clean container for fertilization (Section 9). Take photos of the eggs collected for each fish.
4. Prior to fertilization, a sub-sample of ripe eggs (e.g., 3) will be given to Minnow staff to place into a metal-free sample container for laboratory analysis (Section 9). Take photo of this sample.
5. Each fish will be dissected, and any ovaries (i.e., remaining green eggs) will be removed place into a metal-free sample container for laboratory analysis. Take photo of this sample.
6. Liver will be excised and weighed.
7. Ageing structures will be collected for laboratory analysis. Take photo of this sample.
8. Muscle samples will be collected for laboratory analysis Take photo of this sample.



9 RIPE FISH AND EGG HANDLING/STORAGE

Once ripe and ready RSC are caught, samples of gametes will be collected as follows:

1. Prior to collection of gametes, the fish will be anaesthetized with clove oil (Section 10). The fish will be anaesthetized individually, once the field team is prepared for fertilization, so that the time is minimized between effectiveness of the anaesthetic and stripping of gametes.
2. Dry the fish gently using paper towel and take care to avoid moisture contaminating the samples.
3. Eggs will be expressed by application of gentle pressure to the abdomen. Collect the eggs in a Petri dish, Whirl-Pak bag, or other suitable clean and dry container, taking care to minimize the contact of the eggs with the skin and fins of the fish. It is anticipated that a Petri dish may be an effective collection vessel, since the rigid side of the dish can be held against the fish, allowing the eggs to be expressed over the lip of the dish. Only collect eggs that are freely expressed from the fish.
4. A subsample of eggs will be collected for analytical chemistry. Inspect this subsample using a dissecting scope and record any signs that might be characteristic of ripeness, including the degree of opaqueness of the eggs, distribution of oil droplets, and other observations related to the quality of the sample, such as the presence of blood, ovarian fluid, broken eggs, etc.
5. Milt will be collected from males by application of gentle pressure to the abdomen. Depending on the volume of milt produced, and the readiness with which it is expressed, it may be possible to collect the milt into a Whirl-Pak bag. However, it is likely that the volume produced will be small and, consequently a Pasteur pipette may be used to collect the milt as it is being expressed. Take care to avoid contact with moisture. In the event that the quantity of milt obtained from male fish is too small to divide among the batches of eggs being fertilized, dilute the milt using a small amount of iso-osmotic salt solution. Store the milt samples cold using ice or ice-packs prior to use for fertilization, ensuring that there is no opportunity for water to contaminate the samples and that the milt is not allowed to freeze.
6. Once the gametes have been expressed from the fish, return the adults to the anaesthetic in order to euthanize the fish.
7. The eggs will be fertilized in individual glass Petri dishes by addition of a small amount of milt to the eggs. Mix the eggs and milt gently to ensure contact between the eggs and milt



and to distribute the eggs; the eggs are expected to be sticky following water hardening, and it will be advisable to attempt to separate the eggs across the Petri dish, so that they are not clumped together. After approximately five minutes, add water to the dish and leave the eggs left to water harden. After approximately 20 minutes, rinse the water in the Petri dish to remove excess milt and refill. Water used for water hardening will be the same as water that will be used for rearing the fish in the laboratory, and will be approximately 10 to 12°C.

8. If the eggs adhere to the Petri dish, transfer the dish into a hard plastic container with lid, and fill the container with water. Alternatively, if the eggs do not adhere to the dish, the eggs can be gently poured into the container and the container filled with no head space. Package the containers in coolers and ensure they are kept close to 10 to 12°C for transportation to the laboratory.



10 EUTHANIZATION

When euthanizing fish, set up the euthanasia bath prior to extensive fish handling. The equipment required is:

- one adequately sized tubs,
- fresh water,
- Clove oil,
- Eye dropper.

Set-up and use the euthanasia bath as follows:

1. Set up euthanasia bath, with a clove oil concentration of approximately 60ppm or .06 mL per liter of water
2. Place the fish in the bath.
3. Wait until respiration has stopped.



11 FISH MERISTICS

11.1 Length

Three types of length measurements can be taken from a fish - total, fork, and standard (Figure 1). Total length is measured from the tip of the snout to the dorso-ventrally compressed lobes of the caudal fin. Fork length is the distance between the tip of the snout and the middle of the caudal fin. Standard length is the distance between the tip of the snout of the fish and the middle of the caudal peduncle. When taking a length measurement, ensure that the fish is lying flat on the measuring board, and that its snout is at the end of the board.

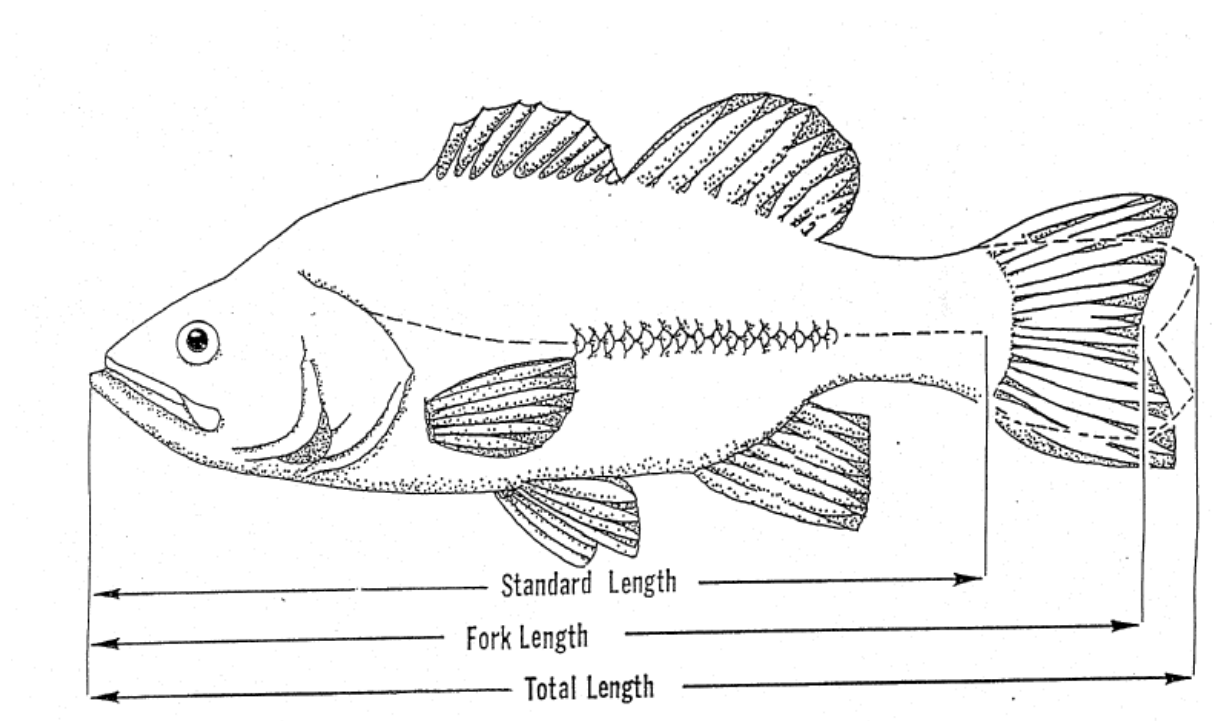


Figure 1: Measurements of Fish Length: Total, Fork, and Standard

11.2 Body Weight

Prior to stripping eggs, fresh whole body weights will be measured using an electronic balance. When measuring the whole body weight, make sure the fish is free of extra water on the surface of its body. If any eggs have spilled prior to weighing, note this on the field sheet.

Assess the scale or balance accuracy each day using standardized weights and calibrate if necessary. Tare the electronic balance prior to each measurement. Always use a scale or balance that is most accurate for the size of the fish being weighed.



11.3 Abnormalities

Fish will be assessed for abnormalities by evaluating the frequency of deformities, erosions, lesions, and tumors (DELT survey; Sanders et. al. 1999¹; see Attachment A) as well as external parasites, and scale disorientation. Record all instances of abnormalities on field sheets and document with photographs.

11.4 Liver Weight

If the fish is not already opened, create an incision (using round-nosed scissors) on the ventral surface of the body from a point immediately anterior to the anus toward a point immediately posterior to the pelvic fin. The liver is located in the anterior visceral cavity behind the heart and ahead of the stomach. It will be pink to dark red to brown in colour, and may consist of several lobes. When removing the liver, ensure that all parts are collected while being careful to exclude obvious fat deposits and the gall bladder. Weigh the liver to the nearest 0.001 g using an electronic balance.

¹ Sanders, R.E., R.J. Miltner, C.O. Yoder, and E.T. Rankin. 1999. The use of external deformities, erosion, lesions, and tumors (DELT anomalies) in fish assemblages for characterizing aquatic resources: A case study of seven Ohio streams. In: T.P. Simon (Ed.), pp: 225-246, Assessing the sustainability and biological integrity of water resources using fish communities. CRC Press, Boca Raton, FL.



12 AGING STRUCTURE COLLECTION

Primary (otoliths) and secondary (pectoral and pelvic fin rays) aging structures will be collected for each fish from which eggs are stripped. Otoliths will be collected by removing the entire head and placing it into a pre-labelled whirl pak bag. Put the sample in a cooler with ice packs, and freeze as soon as possible.

Pectoral and pelvic fin rays will be collected as follows:

1. Using a sharp knife separate the fin ray from the fin and cut around the base of the knuckle.
2. Remove the ray with a knife or scissors by cutting under the knuckle.
3. Strip the ray of as much tissue as possible and remove it cleanly (being sure to include the base/knuckle) from the fish.
4. Wrap the ray in wax paper and insert it into a pre-labelled envelope or sample bag. Both fins can be placed in the same sample container. If the samples are not completely free of muscle/skin tissue, store the samples in a freezer until submission to the laboratory.
5. Photograph sample containers/bags.



13 TISSUE SAMPLE COLLECTION

Prior to tissue sampling, and between sampling individual fish, clean all sampling tools and cutting boards. This is particularly important when collecting tissue samples for chemical analyses. If possible, conduct all dissections in a clean, laboratory environment. When not possible, make sure the dissection area can be kept as sanitary as possible.

13.1 Green Egg Samples for TrichAnalytix

If the fish is not open, then create an incision (using round-nosed scissors) on the ventral surface of the body from a point immediately anterior to the anus toward a point immediately posterior to the pelvic fins. Gonads are located dorso-laterally in the anterior end of the visceral cavity. Ovaries appear whitish to golden brown and have a granular texture. Remove green gonads from the surrounding tissue using forceps and/or round-nosed scissors, and place into a pre-labeled metal-free sample vial. Photograph the sample, place into a cooler, and freeze as soon as possible.

13.2 Muscle Tissue for SRC

A fillet of muscle tissue is collected for tissue chemistry analysis, as follows:

1. Begin by making a shallow cut through the skin on either side of the dorsal fin, from the top of the head to the base of the tail.
2. Then, make a cut behind the entire length of the gill cover cutting through the skin and flesh to the bone.
3. Make a shallow cut along the belly from the base of the pectoral fin to the tail. The first cut is made from behind the gill cover to the anus, and then continued down on both sides of the anal fin. Take care to avoid puncturing an internal organ while filleting the fish, which can contaminate the tissue sample.
4. Remove the fillet by cutting from the incision behind the gill cover, along the spine, to the tail. Include the belly flap in the fillet.
5. Carefully remove the skin and bones remaining in the fillet.
6. Weigh the fillet on an electronic balance and record the weights to the nearest 0.001g. Place the sample into a pre-labelled whirl-pak bag, and photograph it. Store muscle samples on ice (while working in the field) and then place in a freezer as soon as possible.



14 REFERENCE MATERIAL

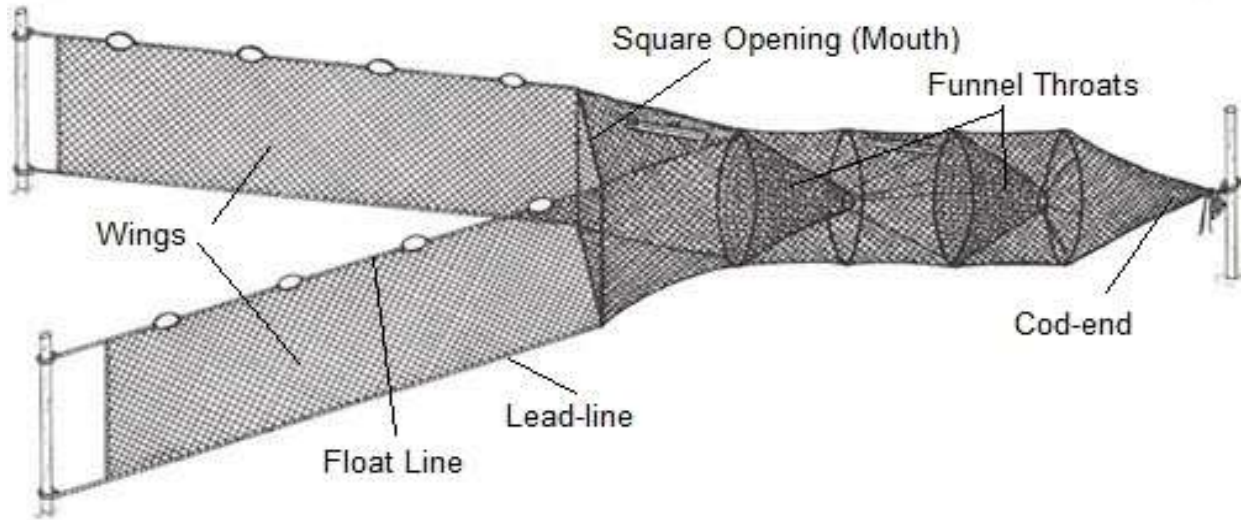


Figure A: Components of a Typical Hoop Net

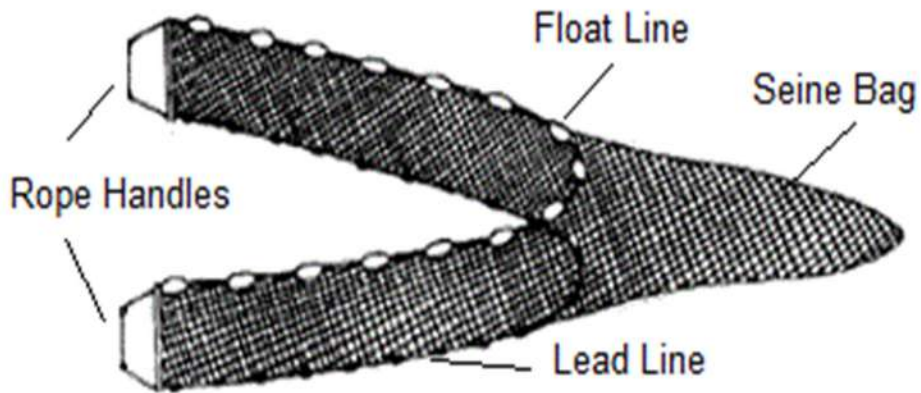


Figure B: A Common Seine Net used for Capturing Fish



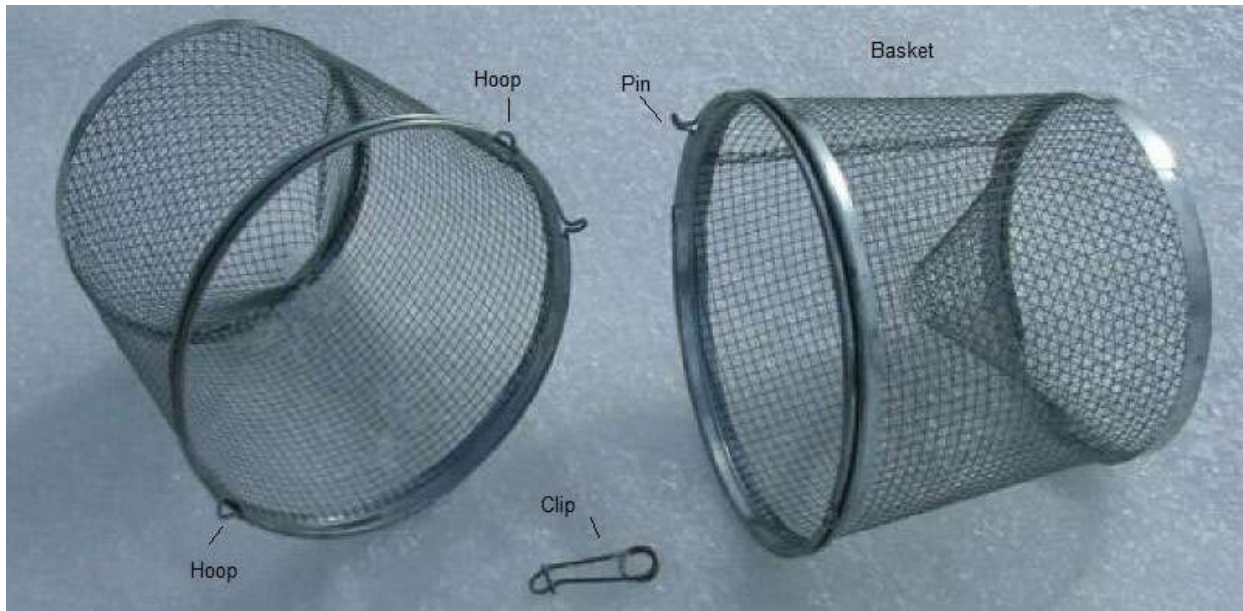


Figure C: A Common Minnow Trap used to Capture Small-bodied Fish



9 The Use of External Deformities, Erosion, Lesions, and Tumors (DELT Anomalies) in Fish Assemblages for Characterizing Aquatic Resources: A Case Study of Seven Ohio Streams

Randall E. Sanders, Robert J. Miltner, Chris O. Yoder, and Edward T. Rankin.

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9.1 INTRODUCTION

Since 1966, an increasing number of studies have reported the occurrence of external fish abnormalities (e.g., deformities, fin erosion, open sores, and tumors) in a variety of aquatic habitats (streams, lakes, estuaries, and marine) and discussed possible relationships between anomalies and environmental quality. Consistently, these studies have reported either a low number or percentage of anomalies at nonpolluted sites or a high number or percentage at polluted sites affected by industrial and sewage discharges, or both (Mills et al., 1966; Shotts et al., 1972; Komada, 1980; Berra and Au, 1981; Murchelano and Ziskowski, 1982; Sherwood, 1982; Cross, 1985; Bengtsson

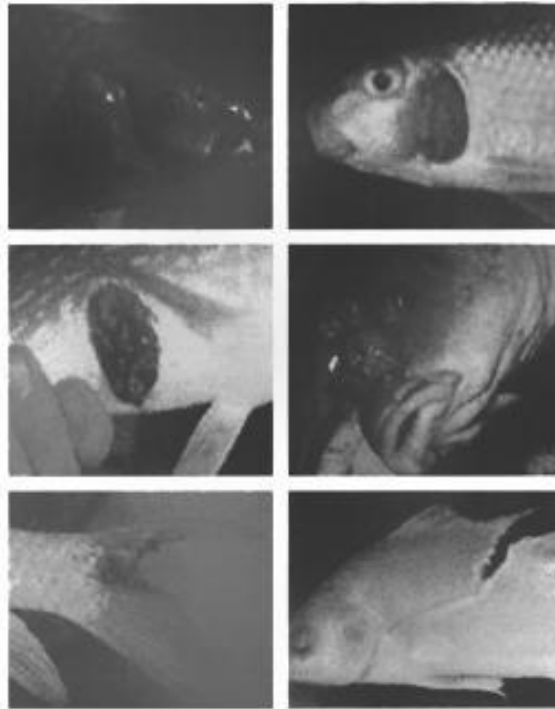


FIGURE 9.1 Five examples of external DELT anomalies and one predator-induced injury. Upper left: A common carp with a severely deformed head (knothead). Upper right: A golden redhorse with a severely eroded gill cover. Middle left: A northern pike with a large lesion/ulceration. Middle right: A common carp with large nasal tumors. Lower left: A silver redhorse with multiple DELT anomalies (severely eroded fin and tumors). Lower right: Predator injuries, such as the one a heron made on this freshwater drum, are not coded as a DELT anomaly by the Ohio EPA.

et al., 1985; Bengtsson and Larsson, 1986; Baumann et al., 1987; Malins et al., 1988; Reash and Berra, 1989; Lindesjoo and Thulin, 1990; McCain et al., 1992; Fournie and Summers, 1996). As the result of these and similar studies, the occurrence of fish anomalies has become an increasingly accepted indicator of environmental quality for water resources and fish health (Karr, 1986; Plumb, 1994; Yoder and Rankin, 1995).

9.1.1 USE OF EXTERNAL DELT ANOMALIES IN BIOASSESSMENTS

Fish with external deformities, erosion, lesions (defined by the Ohio EPA as open sores or exposed tissue), and tumors (neoplasms) (DELT anomalies, Figure 9.1) were first observed by Ohio Environmental Protection Agency (Ohio EPA) biologists in 1979 while sampling a large urban stream, the Scioto River in downtown Columbus. The Scioto River receives a combination of pollutants from industrial and municipal effluent, combined sewer overflows, and urban runoff. Stream flows are also dominated by municipal effluent downstream from Columbus during periods of low flow (Yoder and Rankin, 1995). After a literature review showed a positive relationship between degraded water quality and anomalies (Sniezko, 1962; Mills et al., 1966; Pippy and Hare, 1969; Shotts et al., 1972; Hickey, 1972; Sniezko, 1974), DELT anomalies were incorporated into the Ohio EPA's stream monitoring program. As part of the development of biological criteria in 1987, the percentage of fish with DELT anomalies was then used as a modification of Karr's original metric for the percentage of diseased fish in the Index of Biotic Integrity (IBI; Karr, 1981; Ohio EPA, 1987a;

TABLE 9.1
Index of Biotic Integrity (IBI) Scoring Criteria for the
Percentage of Fish with Deformities, Erosion,
Lesions/Ulcers, and Tumors Captured at Headwater,
Wading, and Boatable Sites

| | Ohio EPA DELT Scoring Criteria | | |
|----------------------------|--------------------------------|-------------|-------|
| | "5" | "3" | "1" |
| Headwater and wading sites | ≤0.1% | >0.1 ≤ 1.3% | >1.3% |
| Boat sites | <0.5% | 0.5 ≤ 3.0% | >3.0% |

Note: Criteria are based on data from more than 300 reference sites throughout Ohio. If DELT is present on >1 individual at sites with ≤1000 total fish, then a score of "5" is assigned; or if 2 DELT individuals are collected at a site with ≤1000 total fish, then a score of "3" is assigned.

1987b; Table 9.1). Blackspot (*Uvulifer ambloplitis* and *Crassiphiala bulboglossa*), anchor worm (*Lernaea cyprinacea*), and other parasites were excluded from the metric (but are still recorded) due to the lack of a consistent, inverse relationship to environmental quality (Allison et al., 1977; Berra and Au, 1981; Whittier et al., 1987). Biocriteria were subsequently adopted into Ohio Water Quality Standards regulations in 1990 (Ohio EPA, 1992a). After realizing a high degree of variability in the severity of DELT anomalies in Ohio streams (e.g., slight fin erosion vs. severely eroded fins and skeletal and multiple anomalies), field criteria for classifying the severity of DELT anomalies were developed by Ohio EPA biologists in 1991.

In addition to IBI scores, longitudinal graphs of the percentage of DELT anomalies and photographs are frequently used in agency reports, presentations, and news releases along with other results to effectively portray the biological and chemical quality of Ohio streams (Ohio EPA, 1992b; 1995; 1996). While many audiences do not easily relate to numerical values that reflect nonattainment of Clean Water Act goals, examples of fish with DELT anomalies are clearly understood by the regulated community, resource managers, and the general public as indicators of a polluted water resource. Through the years, however, it has become obvious that not all fish species are equally susceptible, and a number of questions have arisen as to the Ohio EPA's use of these types of abnormalities. The objectives of this study were to try to answer some of these questions by determining: (1) What are the predominant types of DELT anomalies? (2) Are some fish species more susceptible to DELT anomalies? (3) Is there a statistical relationship between the percentage of DELT anomalies and the two biological indices (IBI and Modified Index of Well-Being [MIwb]) used by the Ohio EPA to assess overall stream quality? (4) Is the severity of DELT anomalies useful in assessing environmental quality?

9.1.2 STUDY AREA

Bioassessment results from seven streams sampled by the Ohio EPA between 1991 and 1995 were selected for this study to encompass a wide range of environmental quality (exceptional to very poor), stream sizes (drainage areas from 6.4 to 75,350 square miles), and land uses (woodland, agricultural, industrial, and urban). The database consisted of 360 electrofishing collections from 139 sampling locations spanning 746 river miles (1194 km). Approximately 181 hours of electrofishing was conducted over a total cumulative distance of 114 miles (184 km). Brief descriptions of the seven streams used in the present study are provided in Table 9.2.

TABLE 9.2
Descriptions of the Seven Ohio Streams Used in the DELT Study

1. *Ottawa River*: Located in northwestern Ohio, the Ottawa River is a medium-size tributary of the Auglaize River (Lake Erie basin). Land use within the 365-square-mile watershed is predominantly agricultural, with the exception of the urban/industrial complex within Lima. Major point source discharges to the river within and near Lima consist of the municipal sewerage system, composed of five large combined sewer overflow structures (CSOs) and a 001, an oil refinery, and a chemical complex. The stream also receives landfill leachate and chemical spills. During periods of low flow, more than 80% of the stream flow is effluent downstream from the three major wastewater discharges. Historically, the Ottawa River has been one of Ohio's most severely impacted streams downstream from Lima. A total of 23 samples from 8 locations (RM 46.1–1.2) were collected (between 27 June and 23 August 1991) and used in this study (Ohio EPA, 1992).
2. *Mahoning River*: Located in northeastern Ohio and western Pennsylvania, the Mahoning River watershed drains a total of 1140 square miles of the upper Ohio River basin. Land use within the watershed consists of a mixture of agriculture, heavy industry, and urbanization. The mainstem receives a multitude of municipal and industrial discharges, CSOs, and stormwater runoff. Historically, the Mahoning River has been severely impacted, but has shown some recovery. In 1994, the mainstem was in predominantly nonattainment of its Warmwater Habitat (WWH) aquatic life use designation throughout the lower 90 miles. Stream quality ranged from exceptional in its headwaters to very poor downstream from Youngstown (Ohio EPA, 1996). A total of 101 samples from 39 locations (RM 100.6–0.2) were collected (between 6 July and 21 September 1994) and used in this study.
3. *Ohio River*: Forming most of Ohio's eastern and southern boundaries, near-shore waters of the Ohio River now occupy Ohio due to impoundment by 10 high-lift navigational locks and dams. The mainstem receives a multitude of point source discharges from sewage treatment plants, heavy industries (e.g., steel mills, chemical plants), coal-fired power plants, and CSOs (ORSANCO, 1994). The mainstem also receives a considerable amount of barge traffic; however, a considerable amount of the watershed (drainage areas ranged from 23,450 to 75,350 square miles) is comprised of agricultural land uses and woodlands. A total of 102 fall night samples from 35 locations (RM 48.8–487.2) were collected (between 23 September 1991 and 31 October 1995) and used in this study (Sanders, 1995).
4. *Salt Creek*: Located in southcentral Ohio, Salt Creek is a medium-size tributary of the Scioto River. Land use within the 555-square-mile watershed is dominated by woodlands and agriculture. The mainstem receives effluent from one small municipal sewage plant in the upper half of the watershed and a second moderate size plant in the headwaters of a major tributary. A total of 23 samples from 13 locations (RM 41.2–0.3) were collected (between 29 June and 22 October 1992) and used in this study; 75% of the mainstem sites were in FULL attainment of Exceptional Warmwater Habitat (EWH) in 1992 (Ohio EPA, unpublished data).
5. *Little Miami River*: Located in southwestern Ohio, the Little Miami River flows in a southwesterly direction to its confluence with the Ohio River. Land use within the 1757-square-mile watershed is predominantly agricultural, followed by forests and suburbanization. The mainstem and tributaries received a cumulative total of approximately 50 million gallons per day (MGD) of municipal and county sewage treatment plant effluent in 1993. Portions of the watershed are developing rapidly, however, and the quantity of effluent is expected to increase. With the exception of elevated total phosphorus and fecal bacteria concentrations, water quality was generally good throughout the mainstem in 1993. Mainstem sediment quality was also good, with few elevated metals or organic compounds; 41% of the mainstem was in FULL attainment of EWH in 1993 (Ohio EPA, 1995). A total of 87 samples from 32 locations (RM 102.1–0.2) were collected (between 29 July and 14 October 1993) and used in this study (Ohio EPA, 1995).
6. *East Fork Little Miami River*: Located in southwestern Ohio, the East Fork is the largest tributary of the Little Miami River. Land use within its 499-square-mile watershed is largely agricultural, but is becoming increasing suburbanized in the lower third, which receives effluent from four WWTPs. Approximately 50% of the lower 15 miles of the mainstem was in FULL attainment of EWH in 1993 (Ohio EPA, 1995). A total of 16 samples from eight locations (RM 15.5–1.4) were collected (between 20 July and 8 September 1993) and used in this study.
7. *Little Beaver Creek*: Located on the east side of Dayton, Ohio, Little Beaver Creek is a small tributary (26.4-square-mile drainage area) of Beaver Creek, which drains into the Little Miami River near Xenia. The stream contains one of the most developed watersheds of the seven streams selected, and receives more than 8 MGD of effluent (the largest discharge in the LMR watershed). Approximately 93% of the lower 4.7 miles of the tributary was in nonattainment of WWH in 1993 (Ohio EPA, 1995). A total of eight samples from four locations (RM 4.7–0.1) were collected (between 7 July and 18 August 1993) and used in this study.

9.2 METHODS

Standardized field, laboratory, and data processing methods and procedures were used in this study (Ohio EPA, 1987a,b; 1989a,b,c). All fish sampling in this study was conducted with two principal types of gasoline-powered, pulsed DC electrofishing gear: (1) 1750-watt pulsator/generator combination (T&J Manufacturers) designed for smaller wadeable streams, and (2) boat-mounted, 3500-watt generator and pulsator combinations (Smith-Root Type 3.5 or 5.0 GPP units) with a straight electrode configuration for wider and deeper boatable streams. Sampling was conducted during the day except in the Ohio River, where night electrofishing was used for improved catches of most species (Sanders, 1992). Each sampling site consisted of a fixed distance ranging from approximately 150 to 200 meters for wading methods and 500 meters for boat-sampled sites. The time required to sample and process the catch at each site ranged from 1 to 3 hours.

Gross external anomalies are defined by the Ohio EPA (Ohio EPA, 1989c) as external skin, fin, or subcutaneous disorders visible to the naked eye during normal sampling procedures (i.e., when the fish are captured, identified, sorted, weighed, and counted). Deformities, erosion (of fins, barbels, and gill covers), skin lesions (i.e., open sores, ulcerations, exposed tissue), and tumors are 4 of the 15 types of anomalies (other types include common parasites and other abnormalities) recorded by Ohio EPA biologists during a fish survey. The DELT anomalies include many of the most obvious external clinical signs of infectious diseases and parasites (Plumb, 1994), and the use of such a "super group" reduces the significance of a misidentification. While every effort is made to correctly identify anomalies, the interchangeability of terms such as eroded and lesion by pathologists makes it less critical what to call an abnormality than whether the anomaly is present or absent. Ohio EPA staff have learned that with minimal training and established criteria, the field identification of DELT anomalies is relatively easy. General definitions and characteristics of the 15 different anomalies recorded are described by the Ohio EPA (1989c). Field biologists are urged to refer to textbooks on fish health for further information and pictures of specific anomalies (e.g., Post, 1987; Plumb, 1994). Questionable specimens were preserved for lab verification.

9.2.1 EXAMINATION OF FISH FOR EXTERNAL DELT ANOMALIES

Although all fish captured are identified and counted during Ohio EPA stream surveys, only fish that are weighed (individually, in aggregate, or by subsample) are examined for external anomalies at most sites (i.e., sites with drainage areas greater than 20 square miles). Typically, this represents most of the fish captured; however, subsampling is recommended when large catches of certain species (e.g., gizzard shad) occur in order to save time on processing in the field. Subsamples by species typically included at least 15 individuals for larger species such as common carp, suckers, and sunfishes, and at least 50 individuals for smaller species such as minnows and darters. A conscious effort was made at all sites to "randomly" select fish for weighing and not skew the results by looking for fish with or without DELTs for weighing. At headwater sites (drainage areas less than or equal to 20 square miles) where fish are not weighed (because the MIwb is not applicable), all fish counted were examined for external DELT anomalies. Once detected, the severity of all DELT anomalies was determined as mild or severe using the standardized criteria (Table 9.3). The time used for examining specimens in the field typically consisted of less than 10 seconds (i.e., long enough to determine the presence or absence of anomalies on one side and classify the severity). For most species, this consisted of looking at one side of the fish, including all visible fins. Ictalurids (catfish) were also examined ventrally for barbel anomalies and parasites.

Anomaly data from each sampling location was then entered into the Ohio EPA fish community database (Ohio ECOS) along with numbers and weight(s) by species. Since the Ohio EPA does not currently calculate the percentage of DELT anomalies for each species (in report form), the percentage by species in this study was based only on fish that were examined for DELTs. The

TABLE 9.3
Ohio EPA's Field Criteria for Determining the Severity (Mild or Severe) of External Deformities, Erosion, Lesions, and Tumors (DELT Anomalies)

| Type of DELT Anomaly (FINS Code) | Severity Criteria |
|---|---|
| Deformed fin, head, vertebrae, barbel, and other body parts | |
| Mild | One deformed fin or branched barbel. |
| Severe | Two or more deformed fins or barbels; or any body (head, vertebrae, abdomen, or other body part) deformity. |
| Eroded fin, gill cover, or barbel | |
| Mild | One or two barbels eroded less than half the barbel length, or a fin ray not eroded past ray fork. |
| Severe | Three or more eroded barbels; or a barbel eroded more than half its total length; >2 fins eroded or fin eroded past a single ray fork or if gill cover is eroded showing exposed gill(s). |
| Lesion (open sore, exposed tissue, or ulceration) | |
| Mild | <2 lesions < the size of the largest scale. |
| Severe | >3 lesions or a lesion > the size of the largest scale or raw tissue. |
| Tumor | |
| Mild | <2 tumors < the diameter of the eye (count patches of Lymphocystis as one tumor). |
| Severe | > 3 tumors or one tumor larger than the diameter of the eye. |

total percentage of all species was calculated for each site, however, by Ohio ECOS, which computes (and sums) each type of anomaly for each species in each sample as a weighted number based on percent occurrence among weighed fish times the total number of that fish species in the sample. A fish with two or more different types of DELT anomalies is coded as an M (for multiple DELT anomalies) to avoid inflating the true percentage. Obvious injuries (e.g., fish-eating-bird or hooking injuries) are not included.

9.2.2 STATISTICAL ANALYSES OF STREAM QUALITY

The two fish indices incorporated into Ohio's biological criteria, the IBI and MIwb, were used to determine if a statistically significant relationship existed between stream quality and the percentage of DELT anomalies. The IBI, first introduced by Karr (1981), consists of 12 metrics that assess fish assemblages based on species richness and composition, trophic composition, abundance, and health. Ohio EPA's modified versions for headwater, wading, and boatable streams were used. The MIwb, a modified version of the Index of Well-Being (Gammon, 1976), is a measure of the fish community based on a calculation using relative number, biomass, and the Shannon Diversity Index (based on numbers and weight) from which highly tolerant and exotic fishes are removed from the numbers and biomass calculations. Higher scores for both indices typically reflect improving quality of fish assemblages or stream quality in general.

The percentage of DELT anomalies from the electrofishing samples collected from the seven streams used in this study were regressed against the MIwb and IBI ($n = 346$ and 360 , respectively) scores computed for those samples. Before computing regression functions, percentage of DELTs were transformed to fit model assumptions with a $\ln(y + 1)$ transformation (Neter et al., 1990). For the regression of $\ln(\text{DELT} + 1)$ on IBI, plots of residuals against estimated values demonstrated nonconstancy of error variance over the range of IBI scores ≥ 35 ; therefore, only data for IBI scores < 35 were considered using the logarithmic transformation (Table 9.4). Percentage of DELTs for IBI scores ≥ 35 were subsequently transformed using $1/Y + 1$ (Neter et al., 1990), resulting in a normal distribution and constancy of error variance as demonstrated by a whisker plot of the

TABLE 9.4
Parameters and Significance Tests for Regressions of
Percentage DELT Anomalies Against MIwb, IBI \geq 35,
and IBI $<$ 35

| Variable | Coefficient | Standard Error | Student's <i>t</i> | <i>p</i> |
|---------------|-------------|----------------|--------------------|----------|
| Constant | 3.9735 | 0.1771 | 22.433 | <0.0001 |
| MIwb | -0.3149 | 0.0205 | 15.344 | <0.0001 |
| Constant | -0.0863 | 0.1620 | -0.53 | 0.5947 |
| IBI \geq 35 | 0.0132 | 0.0036 | 3.66 | <0.0001 |
| Constant | 4.8979 | 0.2732 | 17.93 | <0.0001 |
| IBI $<$ 35 | -0.1185 | 0.1063 | -11.15 | <0.0001 |

Note: The coefficient for IBI \geq 35 is positive due to an inverse transformation.

transformed variable and a plot of residuals against estimated values. Residual and normal probability plots constructed for the regression of $\text{Ln}(\text{DELT} + 1)$ on MIwb did not indicate a strong departure from normality or equality of error variance over the range of observed values.

9.3 RESULTS AND DISCUSSION

Of the 102,164 fish examined for external anomalies, one or more DELT anomalies was observed on 2,657 fish (2.6%). Of the 109 total species and 8 hybrids examined, one or more DELT anomalies was observed on 62 of the species (56.9%) and 5 hybrids (Table 9.5). By stream, Salt Creek (one of Ohio's highest quality rural streams) had the lowest overall percentage of DELT anomalies for both the total number of individuals examined (0.4%) and number of species afflicted (23.1%, Table 9.6). Conversely, the highest percentages of total individuals and species with anomalies occurred in two of Ohio's most biologically and chemically impacted streams, the Ottawa (8.1 and 56.5%, respectively) and Mahoning (7.1 and 60.0%, respectively) rivers. Similarly, the maximum and median values of DELT anomalies by stream were also lowest in Salt Creek (3.0 and 0.3%, respectively) and highest in the Ottawa (57.5 and 13.1%, respectively) and Mahoning (37.9 and 8.2%) rivers (Table 9.6). All but one of the streams had at least one site with no observed DELT anomalies. The exception, Little Beaver Creek, also had a relatively low minimum value of 0.3%.

9.3.1 PREDOMINANT TYPES OF DELT ANOMALIES

Of the 2657 fish with DELT anomalies (all data pooled), the predominant type of anomaly was erosion (56.0%), followed by deformities (30.1%), lesions (7.0%), and tumors (1.2%). Fish with multiple DELT anomalies accounted for 5.6% of all fish with anomalies. Similar patterns in frequency by type were exhibited in six of the streams (Table 9.6). Little Beaver Creek, however, had more deformities than erosion. The overall percentage of DELT anomalies represented by deformities ranged from a minimum of 13.6 in the Ottawa River to a maximum of 44.4 in Little Beaver Creek. The total percentage of deformities was also high and only slightly less than erosion in the Mahoning River, which has multiple complex toxic problems. The overall percentage of erosion was between 40.0 and 60.7 in six of the streams, but reached a maximum of 77.9 in the Ottawa River. Skin lesions were between 0.7 and 12.7%, and tumors between 0.0 and 11.9%. The highest overall percentage of tumors occurred in Salt Creek where all five fish were observed with tumor-like growths apparently caused by the lymphocystis virus. The high rate of tumors in Salt

TABLE 9.5
Summary of the Fishes Collected in Seven Ohio Streams and the Incidence of DELT Anomalies by Taxa

| FAMILY Common Name (<i>Scientific Name</i>) | No. of Streams Collected in | Total No. of Fish Examined | No. of Streams with a DELT | Total No. with DELT Anomalies | % with DELT Anomalies |
|--|-----------------------------------|----------------------------------|----------------------------------|-------------------------------------|-----------------------------|
| ESOCIDAE (pikes) | | | | | |
| muskellunge x northern pike hybrid | 2 | 5 | 1 | 2 | 40.0 |
| muskellunge (<i>Esox masquinongy</i>) | 1 | 15 | 1 | 2 | 13.3 |
| grass pickerel (<i>Esox americanus vermiculatus</i>) | 3 | 22 | 1 | 2 | 9.1 |
| ICTALURIDAE (catfishes) | | | | | |
| black bullhead (<i>Ameiurus melas</i>) | 3 | 15 | 1 | 5 | 33.3 |
| channel catfish (<i>Ictalurus punctatus</i>) | 6 | 1643 | 6 | 236 | 14.4 |
| yellow bullhead (<i>Ameiurus natalis</i>) | 6 | 231 | 5 | 30 | 13.0 |
| brown bullhead (<i>Ameiurus nebulosus</i>) | 1 | 55 | 1 | 6 | 10.9 |
| flathead catfish (<i>Pylodictis olivaris</i>) | 4 | 326 | 2 | 14 | 4.3 |
| stonecat (<i>Noturus flavus</i>) | 4 | 97 | 3 | 4 | 4.1 |
| mountain madtom (<i>Noturus eleutherus</i>) | 2 | 50 | 0 | 0 | 0.0 |
| brindled madtom (<i>Noturus miurus</i>) | 1 | 20 | 0 | 0 | 0.0 |
| tadpole madtom (<i>Noturus gyrinus</i>) | 1 | 1 | 0 | 0 | 0.0 |
| CYPRINIDAE (carps and minnows) | | | | | |
| common carp x goldfish hybrid | 6 | 235 | 6 | 71 | 30.2 |
| common carp (<i>Cyprinus carpio</i>) | 7 | 2624 | 7 | 749 | 28.5 |
| goldfish (<i>Carassius auratus</i>) | 4 | 324 | 3 | 77 | 23.8 |
| golden shiner (<i>Notemigonus crysoleucas</i>) | 4 | 350 | 2 | 11 | 3.1 |
| river chub (<i>Nocomis micropogon</i>) | 4 | 768 | 2 | 19 | 2.5 |
| creek chub (<i>Semotilus atromaculatus</i>) | 6 | 2545 | 5 | 32 | 1.3 |
| redfin shiner (<i>Lythrurus umbratilis</i>) | 1 | 93 | 1 | 1 | 1.1 |
| rosyface shiner (<i>Notropis rubellus</i>) | 4 | 215 | 2 | 2 | 0.9 |
| steelcolor shiner (<i>Cyprinella whipplei</i>) | 3 | 287 | 1 | 1 | 0.3 |
| spotfin shiner (<i>Cyprinella spiloptera</i>) | 7 | 3083 | 4 | 9 | 0.3 |
| central stoneroller (<i>Campostoma anomalum</i>) | 7 | 5615 | 4 | 6 | 0.1 |
| emerald shiner (<i>Notropis atherinoides</i>) | 5 | 5330 | 3 | 4 | <0.1 |
| striped shiner (<i>Luxilus chrysocephalus</i>) | 7 | 1407 | 1 | 1 | <0.1 |
| fathead minnow (<i>Pimephales promelas</i>) | 4 | 1073 | 1 | 1 | <0.1 |
| bluntnose minnow (<i>Pimephales notatus</i>) | 7 | 5769 | 2 | 4 | <0.1 |
| sand shiner (<i>Notropis stramineus</i>) | 6 | 1190 | 1 | 1 | <0.1 |
| silver chub (<i>Macrhybopsis storeriana</i>) | 3 | 1245 | 0 | 0 | 0.0 |
| gravel chub (<i>Erimystax x-punctatus</i>) | 3 | 20 | 0 | 0 | 0.0 |
| blacknose dace (<i>Rhinichthys atratulus</i>) | 5 | 854 | 0 | 0 | 0.0 |
| tonguetied minnow (<i>Exoglossum laurae</i>) | 1 | 1 | 0 | 0 | 0.0 |
| suckermouth minnow (<i>Phenacobius mirabilis</i>) | 6 | 159 | 0 | 0 | 0.0 |
| southern redbelly dace (<i>Phoxinus erythrogaster</i>) | 1 | 2 | 0 | 0 | 0.0 |
| silver shiner (<i>Notropis photogenis</i>) | 5 | 431 | 0 | 0 | 0.0 |

TABLE 9.5 (continued)
Summary of the Fishes Collected in Seven Ohio Streams and the Incidence of DELT Anomalies by Taxa

| FAMILY Common Name (Scientific Name) | No. of Streams Collected in | Total No. of Fish Examined | No. of Streams with a DELT | Total No. with DELT Anomalies | % with DELT Anomalies |
|--|-----------------------------------|----------------------------------|----------------------------------|-------------------------------------|-----------------------------|
| rosefin shiner (<i>Lythrurus ardens</i>) | 3 | 44 | 0 | 0 | 0.0 |
| river shiner (<i>Notropis blennioides</i>) | 2 | 89 | 0 | 0 | 0.0 |
| spottail shiner (<i>Notropis hudsonius</i>) | 1 | 74 | 0 | 0 | 0.0 |
| whitetail shiner (<i>Cyprinella galactura</i>) | 1 | 1 | 0 | 0 | 0.0 |
| mimic shiner (<i>Notropis volucellus</i>) | 2 | 129 | 0 | 0 | 0.0 |
| channel shiner (<i>Notropis wickliffi</i>) | 1 | 321 | 0 | 0 | 0.0 |
| silverjaw minnow (<i>Notropis buccatus</i>) | 5 | 291 | 0 | 0 | 0.0 |
| bullhead minnow (<i>Pimephales vigilax</i>) | 4 | 138 | 0 | 0 | 0.0 |
| other minnow hybrids | 2 | 2 | 0 | 0 | 0.0 |
| CATOSTOMIDAE (suckers) | | | | | |
| bigmouth buffalo (<i>Ictiobus cyprinellus</i>) | 4 | 23 | 2 | 5 | 21.7 |
| black buffalo (<i>Ictiobus niger</i>) | 3 | 142 | 3 | 24 | 16.9 |
| blue sucker (<i>Cycleptus elongatus</i>) | 1 | 7 | 1 | 1 | 14.3 |
| river redhorse (<i>Moxostoma carinatum</i>) | 4 | 80 | 3 | 10 | 12.5 |
| spotted sucker (<i>Minytrema melanops</i>) | 4 | 147 | 2 | 14 | 9.5 |
| silver redhorse (<i>Moxostoma anisurum</i>) | 6 | 641 | 6 | 57 | 8.9 |
| white sucker (<i>Catostomus commersoni</i>) | 5 | 2459 | 4 | 193 | 7.8 |
| quillback (<i>Carpionodes cyprinus</i>) | 5 | 582 | 5 | 44 | 7.6 |
| highfin carpsucker (<i>Carpionodes velifer</i>) | 4 | 64 | 2 | 4 | 6.2 |
| river carpsucker (<i>Carpionodes carpio</i>) | 4 | 299 | 3 | 13 | 4.3 |
| golden redhorse (<i>Moxostoma erythrurum</i>) | 6 | 2890 | 6 | 107 | 3.7 |
| smallmouth buffalo (<i>Ictiobus bubalus</i>) | 4 | 1054 | 3 | 38 | 3.6 |
| black redhorse (<i>Moxostoma duquesnei</i>) | 6 | 1080 | 6 | 38 | 3.5 |
| shorthead redhorse (<i>Moxostoma macrolepidotum</i>) | 4 | 1319 | 3 | 41 | 3.1 |
| northern hog sucker (<i>Hypentelium nigricans</i>) | 7 | 2381 | 4 | 62 | 2.6 |
| creek chubsucker (<i>Erimyzon oblongus</i>) | 1 | 14 | 0 | 0 | 0.0 |
| river carpsucker x quillback hybrid | 2 | 3 | 0 | 0 | 0.0 |
| UMBRIDAE (mudminnows) | | | | | |
| central mudminnow (<i>Umbra limi</i>) | 1 | 8 | 1 | 1 | 12.5 |
| PERCIDAE (perches) | | | | | |
| walleye (<i>Stizostedion vitreum</i>) | 3 | 202 | 2 | 17 | 8.4 |
| sauger x walleye (<i>S. canadense</i> x <i>S. vitreum</i>) | 5 | 61 | 2 | 2 | 3.3 |
| yellow perch (<i>Perca flavescens</i>) | 2 | 415 | 1 | 12 | 2.9 |
| sauger (<i>Stizostedion canadense</i>) | 4 | 3100 | 3 | 22 | 0.7 |
| johnny darter (<i>Etheostoma nigrum</i>) | 5 | 225 | 1 | 1 | 0.4 |
| Logperch (<i>Percina caprodes</i>) | 5 | 757 | 1 | 1 | 0.1 |
| greenside darter (<i>Etheostoma blennioides</i>) | 7 | 1371 | 1 | 1 | 0.1 |
| dusky darter (<i>Percina sciera</i>) | 2 | 48 | 0 | 0 | 0.0 |
| blackside darter (<i>Percina maculata</i>) | 3 | 19 | 0 | 0 | 0.0 |
| slenderhead darter (<i>Percina phoxocephala</i>) | 4 | 60 | 0 | 0 | 0.0 |

TABLE 9.5 (continued)
Summary of the Fishes Collected in Seven Ohio Streams and the Incidence of DELT Anomalies by Taxa

| FAMILY Common Name (Scientific Name) | No. of Streams Collected in | Total No. of Fish Examined | No. of Streams with a DELT | Total No. with DELT Anomalies | % with DELT Anomalies |
|--|-----------------------------------|----------------------------------|----------------------------------|-------------------------------------|-----------------------------|
| river darter (<i>Percina shumardi</i>) | 1 | 127 | 0 | 0 | 0.0 |
| channel darter (<i>Percina copelandi</i>) | 1 | 62 | 0 | 0 | 0.0 |
| eastern sand darter (<i>Ammocrypta pellucida</i>) | 2 | 24 | 0 | 0 | 0.0 |
| banded darter (<i>Etheostoma zonale</i>) | 5 | 552 | 0 | 0 | 0.0 |
| variegate darter (<i>Etheostoma variatum</i>) | 2 | 159 | 0 | 0 | 0.0 |
| bluebreast darter (<i>Etheostoma camurum</i>) | 2 | 2 | 0 | 0 | 0.0 |
| rainbow darter (<i>Etheostoma caeruleum</i>) | 6 | 808 | 0 | 0 | 0.0 |
| orangethroat darter (<i>Etheostoma spectabile</i>) | 4 | 60 | 0 | 0 | 0.0 |
| rainbow x orangethroat darter hybrid | 1 | 1 | 0 | 0 | 0.0 |
| fantail darter (<i>Etheostoma flabellare</i>) | 6 | 982 | 0 | 0 | 0.0 |
| CENTRARCHIDAE (sunfishes) | | | | | |
| pumpkinseed (<i>Lepomis gibbosus</i>) | 4 | 340 | 2 | 22 | 6.5 |
| green sunfish (<i>Lepomis cyanellus</i>) | 7 | 2734 | 4 | 182 | 6.7 |
| largemouth bass (<i>Micropterus salmoides</i>) | 7 | 1239 | 7 | 79 | 6.4 |
| hybrid sunfish | 7 | 169 | 2 | 6 | 3.6 |
| rock bass (<i>Ambloplites rupestris</i>) | 6 | 1040 | 4 | 30 | 2.9 |
| warmouth (<i>Lepomis gulosus</i>) | 4 | 37 | 1 | 1 | 2.7 |
| spotted bass (<i>Micropterus punctulatus</i>) | 5 | 1576 | 4 | 39 | 2.5 |
| white crappie (<i>Pomoxis annularis</i>) | 6 | 632 | 3 | 13 | 2.1 |
| smallmouth bass (<i>Micropterus dolomieu</i>) | 6 | 2222 | 4 | 30 | 1.4 |
| bluegill (<i>Lepomis macrochirus</i>) | 7 | 4429 | 5 | 42 | 0.9 |
| black crappie (<i>Pomoxis nigromaculatus</i>) | 6 | 342 | 2 | 2 | 0.6 |
| longear sunfish (<i>Lepomis megalotis</i>) | 7 | 2091 | 3 | 11 | 0.5 |
| orangespotted sunfish (<i>Lepomis humilis</i>) | 4 | 10 | 0 | 0 | 0.0 |
| redeer sunfish (<i>Lepomis microlophus</i>) | 3 | 7 | 0 | 0 | 0.0 |
| PERCICHTHYIDAE (temperate basses) | | | | | |
| striped bass (<i>Morone saxatilis</i>) | 1 | 116 | 1 | 2 | 1.7 |
| white bass (<i>Morone chrysops</i>) | 5 | 1188 | 2 | 6 | 0.5 |
| white x striped bass hybrid | 2 | 231 | 1 | 1 | 0.4 |
| white perch (<i>Morone americanus</i>) | 2 | 5 | 0 | 0 | 0.0 |
| LEPISOSTEIDAE (gars) | | | | | |
| longnose gar (<i>Lepisosteus osseus</i>) | 3 | 169 | 2 | 3 | 1.8 |
| shortnose gar (<i>Lepisosteus platostomus</i>) | 1 | 2 | 0 | 0 | 0.0 |
| HIODONTIDAE (mooneyes) | | | | | |
| mooneye (<i>Hiodon tergisus</i>) | 2 | 84 | 1 | 1 | 1.2 |
| CLUPEIDAE (herrings) | | | | | |
| gizzard shad (<i>Dorosoma cepedianum</i>) | 7 | 16,497 | 5 | 171 | 1.0 |

TABLE 9.5 (continued)
Summary of the Fishes Collected in Seven Ohio Streams and the Incidence of DELT Anomalies by Taxa

| FAMILY Common Name (<i>Scientific Name</i>) | No. of Streams Collected in | Total No. of Fish Examined | No. of Streams with a DELT | Total No. with DELT Anomalies | % with DELT Anomalies |
|---|-----------------------------------|----------------------------------|----------------------------------|-------------------------------------|-----------------------------|
| skipjack herring (<i>Alosa chrysochloris</i>) | 2 | 368 | 0 | 0 | 0.0 |
| threadfin shad (<i>Dorosoma petenense</i>) | 1 | 5 | 0 | 0 | 0.0 |
| SCIAENIDAE (drums) | | | | | |
| freshwater drum (<i>Aplodinotus grunniens</i>) | 5 | 6864 | 4 | 18 | 0.3 |
| PETROMYZONTIDAE (lampreys) | | | | | |
| silver lamprey (<i>Ichthyomyzon unicuspis</i>) | 1 | 19 | 0 | 0 | 0.0 |
| ohio lamprey (<i>Ichthyomyzon bdellium</i>) | 1 | 2 | 0 | 0 | 0.0 |
| least brook lamprey (<i>Lampetra aepyptera</i>) | 1 | 6 | 0 | 0 | 0.0 |
| american brook Lamprey (<i>Lampetra appendix</i>) | 1 | 1 | 0 | 0 | 0.0 |
| POLYDONTIDAE (paddlefish) | | | | | |
| paddlefish (<i>Polyodon spathula</i>) | 1 | 1 | 0 | 0 | 0.0 |
| ANGUILLIDAE (freshwater eels) | | | | | |
| american eel (<i>Anguilla rostrata</i>) | 1 | 1 | 0 | 0 | 0.0 |
| AMIIDAE (bowfins) | | | | | |
| bowfin (<i>Amia calva</i>) | 1 | 6 | 0 | 0 | 0.0 |
| CYPINODONTIDAE (killifishes) | | | | | |
| blackstripe topminnow (<i>Fundulus notatus</i>) | 3 | 43 | 0 | 0 | 0.0 |
| ATHERINIDAE (silversides) | | | | | |
| brook silverside (<i>Labidesthes sicculus</i>) | 5 | 107 | 0 | 0 | 0.0 |
| COTTIDAE (sculpins) | | | | | |
| mottled sculpin (<i>Cottus bairdi</i>) | 4 | 164 | 0 | 0 | 0.0 |
| TOTALS | | 102,164 | — | 2657 | — |

Note: The percentage of DELT anomalies is listed in descending order by family (based on the species with the highest value) and taxa. No species were deleted due to low numbers. Nomenclature follow Robins et al. (1991).

Creek is surprising, however, because it was the only stream that did not have a fish with two or more (multiple) DELT anomalies. In the other six streams, fish with multiple anomalies represented 3.4 to 7.5% of the total anomalies.

In contrast to the present study results, two similar Ohio studies reported deformities as the predominant anomaly type in three streams surveyed near Mansfield, Ohio. Berra and Au (1981) found spinal curvature followed by deformed fins the most common types of anomalies in Cedar Fork (a small headwater tributary), while Reash and Berra (1989) also reported that deformities were also the most common type of anomalies observed on fishes in the Clear Fork and Rocky Fork (two larger streams within the same watershed). Fournie and Summers (1996) reported skin lesions (mostly fin erosion) as the most common type of anomaly in the Virginian and Louisianian provinces. Gill erosion, however, was apparently included in a category of branchial and gill abnormalities.

Many previous studies have focused on single types of external anomalies (e.g., deformities or eroded fins), which makes their results difficult to compare to the present study (Sherwood, 1982;

TABLE 9.6
Summary Statistics for the Seven Study Area Streams

| | Ottawa River | Mahoning River | Ohio River | Salt Creek | Little Miami River | East Fork | Little Beaver Creek |
|---------------------------------|--------------|----------------|------------|------------|--------------------|-----------|---------------------|
| Total no. of fish examined | 7052 | 14,460 | 41,267 | 9571 | 23,456 | 3674 | 2684 |
| Total % fish with DELT(s) | 8.1 | 7.1 | 1.0 | 0.4 | 2.1 | 2.4 | 1.7 |
| % of total species afflicted | 56.5 | 60.0 | 37.2 | 23.1 | 50.0 | 38.2 | 45.8 |
| Minimum % DELT | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Maximum % DELT | 57.5 | 37.9 | 9.2 | 3.0 | 11.7 | 6.9 | 5.1 |
| Median % DELT | 13.1 | 8.2 | 0.9 | 0.3 | 1.9 | 2.9 | 1.8 |
| Total no. of DELTs + M | 574 | 1025 | 401 | 42 | 481 | 89 | 45 |
| % Deformed (of total no. DELTs) | 13.6 | 39.3 | 28.4 | 28.6 | 31.0 | 27.0 | 44.4 |
| % Eroded fins and gill covers | 77.9 | 46.6 | 56.4 | 50.0 | 50.9 | 60.7 | 40.0 |
| % Lesions (skin) | 0.7 | 8.0 | 6.7 | 9.5 | 12.7 | 9.0 | 2.2 |
| % Tumors | 0.3 | 0.8 | 2.0 | 11.9 | 1.2 | 0.0 | 6.7 |
| % Multiple DELTs (M) | 7.5 | 5.3 | 6.5 | 0.0 | 4.2 | 3.4 | 6.7 |
| DELT severity ratio | 0.87 | 0.75 | 0.84 | 0.45 | 0.46 | 0.37 | 1.81 |

Note: "M" denotes fish with multiple DELT anomalies. The DELT Severity Ratio (based on criteria presented in Table 9.3) is calculated by summing the number of fish with severe and multiple DELTs divided by the number of fish with mild DELTs.

Murchelano and Ziskowski, 1982; Cross, 1985; Bengtsson et al., 1985; Bengtsson and Larsson, 1986; Baumann et al., 1987; Lindesjoo and Thulin, 1990). Eroded fins are, however, a clinical sign for at least two of the most common bacterial infections (Plumb, 1994). Columnaris (*Flavobacterium columnare*) is one of the most common fish diseases frequently associated with fin rot. Another, motile *Aeromonas septemicia* (MAS) has been one of the most frequently diagnosed bacterial diseases of fish based on data compiled by the Fish Disease Committee of the Southern Division of the American Fisheries Society (Plumb, 1994). Post (1987) reports that all freshwater fishes are susceptible to both of these diseases.

9.3.2 PREDOMINANT SPECIES WITH DELT ANOMALIES

The results showed a wide range in the overall percentage of DELT anomalies by species for the 117 taxa collected from the 7 streams (Table 9.5). The taxa with the highest overall percentages of DELTs were muskellunge x northern pike (40.0), black bullhead (33.3), common carp x goldfish hybrid (30.2), carp (28.5), goldfish (23.8), and bigmouth buffalo (21.7). The species with the majority of the total DELT anomalies observed in the study (number of each species with DELTs/total number of fish with DELTs [$n = 2657$]), however, were common carp (28.2%), followed by channel catfish (8.9%), white sucker (7.3%), green sunfish (6.8%), and gizzard shad (6.4%). These percentages of DELTs for the first four species greatly exceeded their relative abundance based on the total catch (e.g., common carp had 28.2% of the total DELT anomalies, but represented only 2.6% of the catch). The relative abundance of gizzard shad, however, was more than double the percentage of the total number of DELTs (16.1% vs. 6.4%).

The most frequently occurring species with DELT anomalies were common carp and largemouth bass, the only two species collected in all seven streams with DELT anomalies. Six other species collected in two or more streams (black buffalo, silver redhorse, quillback, golden redhorse, black redhorse, and channel catfish) and one hybrid (common carp x goldfish) had at least one individual with a DELT anomaly in all streams from which collected.

By family, the highest percentages of afflicted species (with more than one species) were Esocidae (pikes, 100), Catostomidae (suckers, 88.2%), Centrarchidae (sunfishes, 85.7), Percichthyidae (temperate basses, 75), Ictaluridae (catfishes, 66.7), and Cyprinidae (carps and minnows, 50%). Based on the mean percent of species within families, families with the highest occurrences were Esocidae (20.8), Ictaluridae (8.9), and Catostomidae (7.4), followed by Cyprinidae (2.9) and Centrarchidae (2.6).

Conversely, no DELT anomalies were observed on 50 taxa, 29 of which were minnows and darters. Other families of fish with more than 10 individuals collected and no observed anomalies included Petromyzonidae (lampreys), Cyprinodontidae (killifishes), Atherinidae (silversides), and Cottidae (sculpins). In general, the data show a higher percentage of anomalies for the larger, longer-lived, pollution-tolerant taxa than for the smaller, shorter-lived, pollution-sensitive taxa. Many of the highest percentages of anomalies were detected on medium- to large-size bottom-feeding taxa (carp, suckers, and catfish). Many of the smaller benthic species (e.g., darters), however, rarely had an anomaly. Recent field observations support the present study's results that some minnow species are less susceptible to DELT-type anomalies. During the summer of 1996, extra time was used in the examination of DELT anomalies on minnows from one of the Ottawa River's most severely impacted sites (overall percentage of DELT anomalies was 29.2). Results showed four (fathead minnow, spotfin shiner, central stoneroller, and redfin shiner) of the six minnow species collected did not have any DELT anomalies, while all three of the sunfish species collected had at least one DELT anomaly. Additionally, the percentage of DELTs on creek chubs and bluntnose minnows was lower (20.0 and 21.4, respectively) than on bluegills, largemouth bass, and green sunfish (100, 100, and 41.2, respectively). Age may also contribute to the presence of DELT anomalies on various species (e.g., younger fish may have less anomalies because of a shorter exposure time to various stressors). However, observations in the Ottawa River have revealed high percentages of eroded fins on juvenile bluegills.

A previous Ohio study of anomalies on stream fishes reported that white suckers in Cedar Fork had the highest percentage (0.9) of the six species afflicted by anomalies (Berra and Au, 1981). That study also supports the results shown in this study, that even the most susceptible species do not have high percentages everywhere. Also in Ohio, Berra and Au (1981) reported that two abundant species, rainbow darter and creek chub, had no deformities. Elsewhere, Plumb (1994) reports that common carp, channel catfish, and goldfish are particularly susceptible to columnaris disease. Carp and goldfish are also commonly afflicted by *Aeromonas salmonicida achromogens* (also referred to as "atypical nonmotile *Aeromonas*"), which can result in DELT-type anomalies (Plumb, 1994). Fournie and Summers (1996) reported higher rates of abnormalities in demersal fish species (bottom dwelling) than in pelagic or piscivorous fishes.

9.3.3 DELT ANOMALIES VS. STREAM QUALITY

Regressions of the percentage of DELT anomalies against both the IBI and MIwb showed significant inverse relationships. High percentages of DELTs were associated with poor or very poor quality fish assemblages, while consistently low levels of the anomalies were correlated with very good to exceptional assemblages (Figure 9.2). Measured against the IBI, the percentage of DELT anomalies increased linearly with decreasing fish community performance across a range of scores indicating normal to exceptionally good fish assemblages. However, the number of DELTs increased exponentially at degraded sites (i.e., sites with IBI scores <35). Although the percentage of DELT anomalies is used in the calculation of IBI scores, the percentage can only influence scores by a total of four units. Elevated percentages of DELTs often occur in conjunction with less than full attainment of aquatic life use designations, which requires multiple IBI metrics to deviate from the reference condition and results in deductions of more than 12 units. An IBI analysis (by metric) of an impaired segment of the upper Little Miami River shows impacted fish assemblages scored poorly due to a shift from top carnivores to omnivorous and lower than expected

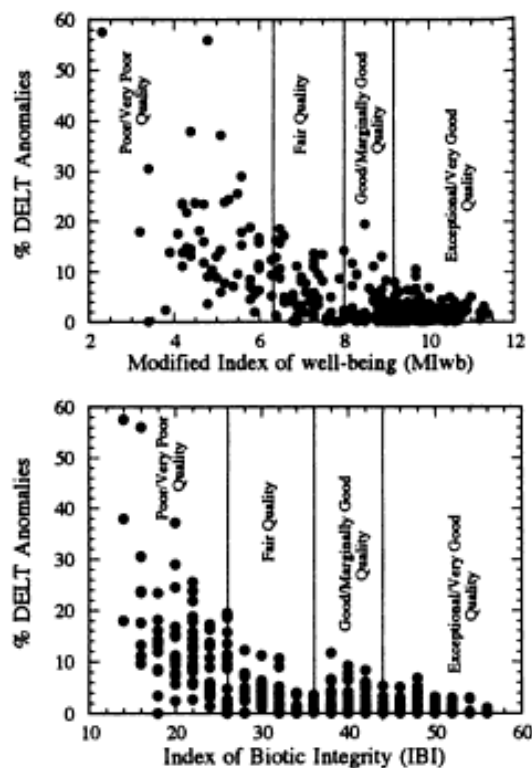


FIGURE 9.2 Scatter plots of the percent DELT anomalies by Modified Index of Well-Being (MIwb, top graph) and Index of Biotic Integrity (IBI, bottom graph) showing the narrative evaluations for stream quality based on Ohio EPA biological criteria.

numbers of intolerant species along with elevated DELT percentages (Figure 9.3). Measured against the MIwb, which is not influenced by anomalies, the percentage of DELTs tended to increase exponentially across the full range scores. The differing nature of regression functions between the IBI and MIwb could be due to the narrow interval of scores representing normal to exceptional communities for the MIwb compared to that for the IBI, and not to differing sensitivities to environmental perturbations.

Previous Ohio EPA reports on study area streams (Ohio EPA, 1992b; 1995; 1996) have shown longitudinal trends in the percentage of DELT anomalies and the IBI and MIwb that also support an inverse relationship. Similar longitudinal trends of low to no DELT anomalies at upstream control or background sites, but increased percentages of DELTs downstream from point source discharges and other pollution sources, are also shown by individual species in different streams (Figure 9.4) and multiple species in a single stream (Figure 9.5). Box plots of the percentages of DELT anomalies from the seven study area streams and 13 other Ohio streams are shown in Figure 9.6. These plots show the percentage of DELT fish is predominantly less than 3.0 in least-impacted streams (and upstream control sites in impacted streams) and greater than 3.0 in streams with multiple point-source discharges and low flows dominated by effluent.

At least one other Ohio study and two coastal studies have reported similar trends between point source discharges and the prevalence of DELT-type anomalies. Reash and Berra (1989) found that unpolluted sites (Clear Fork and Rocky Fork) had a lower percentage of the total catch afflicted by fin erosion and deformities (0.9 and 0.7, respectively) than polluted Rocky Fork sites (10.4) within and downstream from Mansfield. Reash and Berra (1989) also found similar anomaly

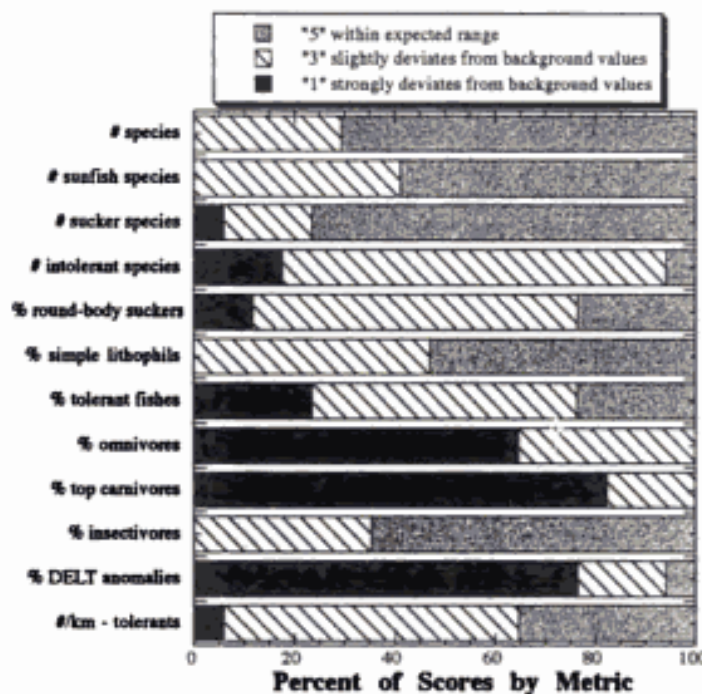


FIGURE 9.3 Metric analysis for Index of Biotic Integrity scores from an impaired segment of the Little Miami River downstream from Xenia, Ohio. Percent of metric values (by metric) scoring a "1", "3", and "5" are shown. Values that score a "1" strongly deviate from the expected are shown in solid black. A predominance of solid black indicates a rather severely degraded component of a fish assemblage. Values that score a "3" slightly deviate from the expected, and a "5" value is within the expected range for the biotic integrity of water resources.

trends for individual species. The percentage of individuals with erosion and deformities for three species markedly increased at the polluted sites within and downstream from Mansfield (creek chub from 0.8 to 7.5, white sucker from 7.9 to 41.1, and green sunfish from 3.6 to 28.3). Lindesjoo and Thulin (1990) also found a clear correlation between an industrial Swedish bleach pulp mill effluent and fin erosion on perch and ruffe with decreasing frequencies at increasing distance from the discharge point. Cross (1985) also reported the highest percentage of fin erosion close to a southern California municipal wastewater outfall and declining rates with increasing distance from the point source.

Compared to upstream background sites, the percent of species afflicted with DELT anomalies also markedly increased downstream from multiple point source discharges in the study area streams. In the Ottawa River, only 13.1% of species had anomalies upstream from Lima (River Mile 46.1) compared to 61.1% downstream from Lima (River Mile 34.7). Table 9.6 shows similar values in the percentage of species afflicted in a rural stream (23.1 in Salt Creek) and a markedly higher level in a highly urbanized industrial stream (60.0% in the Mahoning River). Similar to Salt Creek, Berra and Au (1981) also reported a low percent of total species afflicted (17.6) and overall rate of anomalies (0.26%) in Cedar Fork, a small rural tributary of Clear Fork with a predominantly agricultural watershed.

9.3.4 SEVERITY OF DELT ANOMALIES (SEVERE VS. MILD)

The severity of DELT anomalies also appeared positively related to the degree of impact. Box plots of common carp in four of the streams show markedly lower percentages of severe DELT

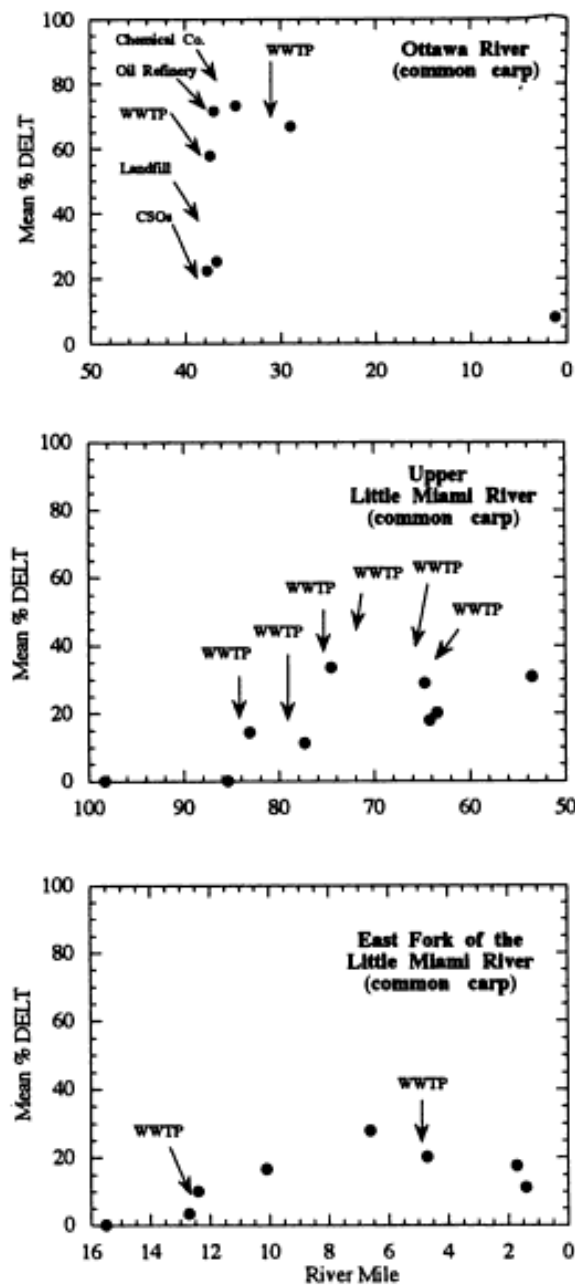


FIGURE 9.4 Longitudinal scatter plots (upstream to downstream) of the mean percentages of common carp with DELT anomalies in the Ottawa River (top), upper Little Miami River (middle), and lower East Fork of the Little Miami River (bottom). Only point source discharges (effluent) of more than 0.75 million gallons per day (MGD) are shown.

anomalies in two streams predominated by municipal WWTP discharges (Little Miami River and its East Fork) than two streams that receive (and historically received) heavy industrial effluent, municipal effluent, and larger quantities of untreated sewage overflows (Mahoning and Ottawa

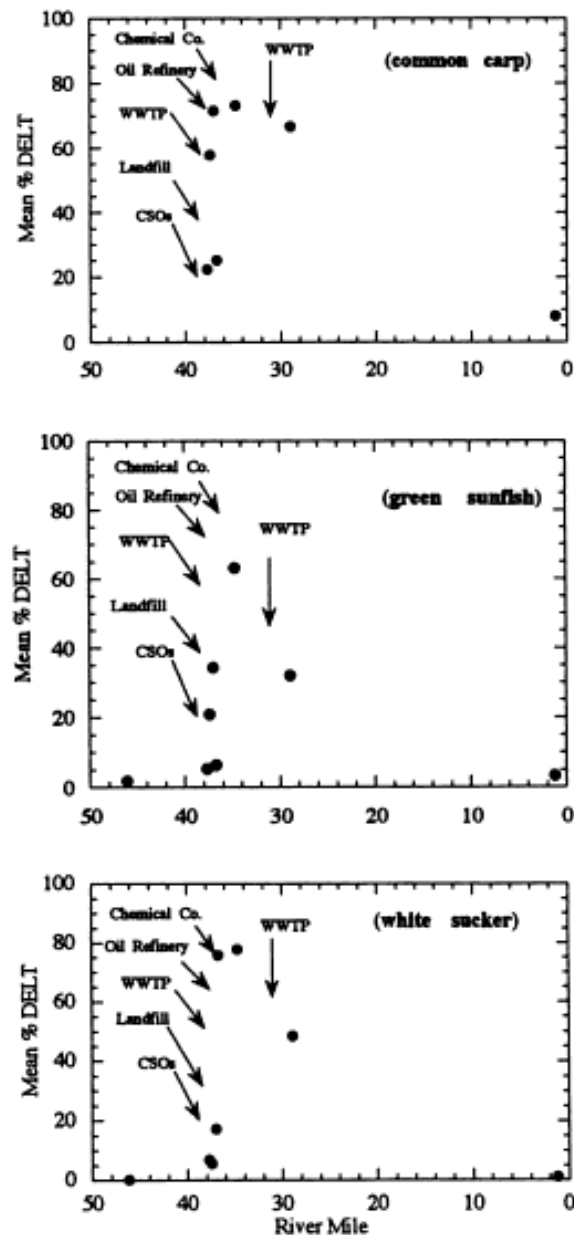


FIGURE 9.5 Longitudinal scatter plots of the mean percentage of common carp (top), green sunfish (middle), and white sucker (bottom) with DELT anomalies in the Ottawa River. Point source dischargers shown had volumes of more than 0.75 million gallons per day (MGD).

Rivers; Figure 9.7). The 75th percentile values in both nonindustrial streams were equal to or less than the 25th percentile values for the two industrial streams. The ratio of fish with severe plus multiple DELT anomalies to mild DELT anomalies also differs (Table 9.6). The least impacted streams primarily influenced by agricultural runoff and municipal wastewater had values < 0.5, while the more severely impacted streams with complex, multiple causes and sources of pollutant-related stresses (e.g., municipal and industrial discharges, combined sewer overflows, urban and

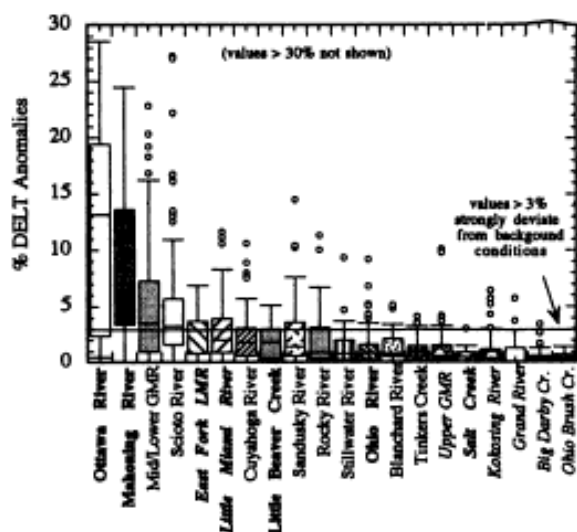


FIGURE 9.6 Box plots (upper, middle, and lower horizontal lines show 75th, 50th, and 25th percentile values, respectively) of the percentages of DELT anomalies in 20 Ohio streams ranked by median values. The seven study area streams are shown in bold. Streams with Exceptional Warmwater Habitat aquatic life use designations are shown in italics.

agricultural runoff, contaminated sediments, and toxics) contained values > 0.5. Yoder and Rankin (1995) developed patterns of response between the IBI, MIwb, and DELT anomalies, termed "biological response signatures," which are combinations of fish community attributes that consistently indicate a general type of environmental or pollution stress. High occurrences of DELT

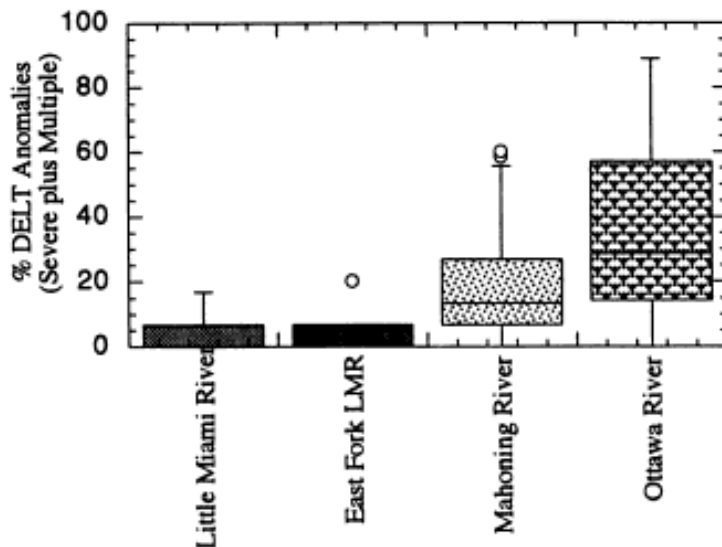


FIGURE 9.7 Box plot (upper, middle, and lower horizontal lines show 75th, 50th, and 25th percentile values, respectively) comparisons of the percentages of fish with severe and multiple DELT anomalies in two nonindustrial streams (Little Miami River and East Fork of the Little Miami River) with multiple sewage plant discharges and two streams with large industrial discharges (Mahoning and Ottawa Rivers).

anomalies (>10–15%) in combination with low IBI and MIwb scores reflecting poor to very poor community condition consistently occurred in stream segments stressed by complex combinations of municipal and industrial sources that frequently exhibited toxicity to bioassay test organisms or exceedences of known chemical toxicity thresholds both in the water column and bottom sediments. A direct relationship between common carp with “knothead” and the severity of pollution in the Illinois River was first reported in 1928 (Thompson, 1928; Mills et al., 1966). In Ohio, common carp with severe knothead (Figure 9.1) have been consistently captured downstream from large industrial effluents (e.g., Mahoning and Ottawa rivers), but have rarely been observed in streams receiving only municipal sewage effluent (e.g., Little Miami River and East Fork of the Little Miami River). The total percent of fish with anomalies in the Ohio River and Beaver Creek was relatively low; however, the severity ratio was high and indicative of impacts from complex industrial and municipal effluents.

Reash and Berra (1989) also found that the severity of fin erosion (based on number of fins afflicted) and the prevalence of fin erosion and deformities were greater at polluted sites than at nonpolluted sites. Additionally, the most common type of anomaly at nonpolluted sites in Clear Fork were fin deformities (usually considered a mild deformity by the Ohio EPA if afflicting only one fin) compared to spinal curvatures (always considered a heavy deformity by the Ohio EPA) at the polluted sites in Rocky Fork. In addition to the severity of individual anomaly types, the presence of multiple types of DELT anomalies on individual fish also appears to be indicative of more severe impacts. Salt Creek was the only stream in the present study with no multiple DELTs recorded. Similarly, Berra and Au (1981) found no individual fish in Cedar Fork to have more than one type of anomaly.

9.4 CONCLUSION

Overall, these results from seven Ohio streams support the findings of previous studies, which have shown or suggested an inverse relationship between the prevalence or percentage of DELT-type anomalies and environmental quality. As used by the Ohio EPA, the percentage of external DELT anomalies in fish assemblages has proven to be an effective IBI metric and accurate indicator of chemical water and sediment quality in streams over a wide range of drainage areas and geographically different basins throughout Ohio. When compared with background levels, elevated occurrences of DELT anomalies in Ohio have been most often found in association with point source discharges, particularly those associated with industrial and municipal wastewater effluents. The incidents of DELTs in wild Ohio fish assemblages has also been useful because conclusions can be made based on both elevated and nonelevated levels. Increased or elevated rates are typically indicative of fish assemblages stressed by chemical pollutants. High bacterial levels (e.g., motile members of the genus *Aeromonas*) may also play an important role in association with sewage-related effluent and combined sewer overflow releases. Low or no anomalies in Ohio typically suggest good chemical water and sediment quality. Biological impairment has been detected in Ohio streams in conjunction with low or no anomalies; however, the cause of impairment was typically due to physical factors (e.g., physical habitat) as opposed to chemical factors. This also corresponds to the findings of Yoder and Rankin (1995).

Two factors that contribute to the usefulness of DELT anomalies as a reliable and accurate indicator of stream quality include the susceptibility of many fish species and a consistently low natural rate at background or reference sites. The results of this study, based on similar longitudinal trends, also suggest that the detection of anomalies could be limited to the more susceptible species (e.g., common carp, white suckers, redhorse species) to reduce the amount of time spent on processing fish and eliminate the possibility of potentially skewing the results by capturing large numbers of species that are not as susceptible (e.g., most minnow species). This would only be recommended, however, if one or more of the selected species were present at all sampling locations. The selection should also include several species from each family to account for different assem-

blages due to changes in stream size (i.e., headwaters to large rivers). Based on the results of this study, good indicator taxa include the common carp, goldfish, common carp x goldfish hybrid, channel catfish, bullheads, white sucker, redhorses and most other sucker species, green sunfish, largemouth bass, and pike species. Methods may also be improved by not including juvenile fish (e.g., set a minimum length limit) in the DELT rate. The severity of DELT anomalies based on the Ohio EPA's criteria for severe and mild cases also appears important in assessing the complexity and severity of impacted fish assemblages.

After more than 10 years of use in the Ohio EPA's surface water program, the percentage of DELT anomalies has proven to be a reliable indicator of fish community condition. This indicator has responded in an intuitively correct and predictable manner and has been informative across a wide gradient of environmental conditions and stresses. It has been most helpful in identifying sites degraded by multiple and cumulative stresses. Preserved specimens or photographs of fish with DELT anomalies have also proven to be an effective communicator of degraded stream quality to resource managers, the regulated community, and the general public. It is important to realize, however, that elevated occurrences of DELT anomalies may be part of the recovery process for many of the most historically impaired streams. As pollution levels have been reduced in many of Ohio's larger streams, pollution-sensitive fish species have returned; however, many have locally elevated levels of anomalies. The return of these species (even with a DELT anomaly) should be construed as a positive sign of recovery, as well as an indication of continued toxicity or other pollution-related stress(es) and the need for additional pollution abatement measures. With millions of dollars being spent to monitor and restore stream quality throughout the United States, accurate environmental indicators such as DELT anomalies may also prove useful in other states, so that future abatement measures are well directed and result in measurable improvements. Biologists interested in duplicating the fish sampling methods used in this study are encouraged to contact the Ohio EPA.

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APPENDIX D

Field Data



Photograph D-1: Loon Lake ripe male



Photograph D-2: Loon Lake 1 ripe female



Photograph D-3: Loon Lake 8 ripe female



Photograph D-4: ERIMF male



Photograph D-5: ERIMF ripe female



Photograph D-6: ERIMF unripe female



Photograph D-7: Kooicanusa Elk River ripe female



Photograph D-8: STPD ripe female



Photograph D-9: GO13 unripe male



Photograph D-10: Grave Lake unripe male

APPENDIX D.1 DATA QUALITY REVIEW

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D1 INTRODUCTION

D1.1 Background

A variety of factors can influence the physical, chemical, and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Depending on their magnitude, inaccuracy or imprecision have the potential to affect the reliability of any conclusions made from the data. Therefore, it is important to ensure that programs incorporate appropriate steps to control the non-natural sources of data variability (i.e., minimize the variability that does not reflect natural spatial and temporal variability in the environment) and thus assure the quality of the data. Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. A Data Quality Report (DQR) involves comparison of actual field and laboratory measurement performance to Data Quality Objectives (DQOs) established for a particular study, such as evaluation of Laboratory Reporting Limits (LRL), blank sample data, data precision (based on field and laboratory duplicate samples), and data accuracy (based on matrix spike recoveries and/or analysis of standards or certified reference materials). Trusted analytical laboratories certified by Canadian Association for Laboratory Accreditation (CALA) with a rigorous internal quality assurance program was selected to ensure the highest possible data quality. DQOs were established *a priori* to reflect reasonable and achievable performance expectations. Programs involving a large number of samples and analytes usually yield some results that exceed DQOs. This is particularly so for multi-element scans since the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the parameters fail to meet DQOs. Overall, the intent of DQR is not to reject any measurement that did not meet a DQO, but to ensure that any questionable data received more scrutiny to determine what effect, if any, this had on interpretation of results within the context of the project.

D1.2 Quality Control Samples

A Data Quality Review (DQR) was conducted on water quality laboratory data collected as part of the 2019 Redside Shiner (RSC) Selenium Toxicity Supporting Study. The objective of DQR is to define the overall quality of the data presented in the report, and, by extension, the confidence with which the data can be used to derive conclusions.

DQR involves the examination of analytical results associated with several types of Quality Control (QC) samples collected (or prepared) in the field and laboratory. QC samples collected for this project, and a description of each, include the following:



- **Blanks** are samples of de-ionized water and/or appropriate reagent(s) that are handled and analyzed in the same way as regular samples. These samples will reflect any contamination of samples occurring in the field (in the case of field or travel blanks) or in the laboratory (in the case of laboratory or method blanks). Analyte concentrations should be non-detectable, although a DQO of twice the method detection limit allows for slight “noise” around the detection limit.
- **Laboratory Duplicates** are replicate sub-samples created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Field Duplicates** are samples collected from a randomly selected field station that are homogenized to the extent possible, split and analyzed separately in the laboratory. The duplicate samples are handled and analyzed in an identical manner in the laboratory.
- **Spike Recovery Samples** are created in the laboratory by adding a known amount/concentration of a given analyte (or mixture of analytes) to a randomly selected test sample previously divided to create two sub-samples. The spiked and regular sub-samples are then analyzed in an identical manner. The spike recovery represents the difference between the measured spike amount (total amount in the spiked sample minus the amount in the original sample) relative to the known spike amount (as a percentage). Two types of spike recovery samples are commonly analyzed. Laboratory control samples (LCS; or spiked blanks) are created using laboratory control materials whereas matrix spikes (MS) are created using field-collected samples. The analysis of spiked samples provides an indication of the accuracy of analytical results.
- **Certified Reference Materials** are commercially-prepared (or commercially-homogenized) samples containing known chemical concentrations that are processed and analyzed along with batches of environmental samples. The sample results are then compared to target results to provide a measure of analytical accuracy. The results are reported as the percent of the known concentration that was recovered in the analysis.



D2 WATER CHEMISTRY

D2.1 Laboratory Reporting Limits

The analytical ALS Laboratory Reports (L2269908, L2270399, L2271140, L2271157, L2272864, L2273883, L2277038, L2278104, L2279040, L2280498, L2284959) were examined to provide an inventory of analytes for which the sample results were less than the LRL, and the maximum LRL for these analytes were assessed relative to existing British Columbia water quality guidelines (BCMOE 2018, 2019). Except for dissolved copper and total silver, the analytes that were less than the LRL all had maximum LRLs which were lower than the respective guidelines, indicating that the achieved LRLs were appropriate for this study (Appendix Tables D.1 and D.2). For dissolved copper, seven out of 36 samples were reported as less than the LRL, and the LRL (<0.0005 mg/L) was above the recently revised lowest chronic copper guideline that was released after the collection of this data (0.0002 mg/L; BCMOE 2019) (Appendix Table D.1). However, all dissolved copper data were reported as <0.0005 mg/L, and so

D2.2 Laboratory and Field Blanks

A total of 274 method blank samples were analyzed in the ALS Laboratory Reports (L2269908, L2270399, L2271140, L2271157, L2272864, L2273883, L2277038, L2278104, L2279040, L2280498, L2284959). Of the 994 reported method blank results, two (one dissolved aluminum [L2284959] and one dissolved copper [L2277038]) exceeded the laboratory DQO and had detectable concentrations. For dissolved aluminum, sample data was considered reliable if it was reported as below the LRL, or greater than five times the blank level; since this was observed for the samples in Report L2284959, these data were considered reliable. For dissolved copper, the MB (0.0148 mg/L) was 74-times higher than the DQO (<0.0002 mg/L). However, all results in Report L2277038 were <0.0005 mg/L, indicating there was no inadvertent laboratory contamination for these samples. Overall, this indicates that laboratory contamination of the collected water samples did not occur.

A total of four trip blank and four field blank samples were analyzed (Reports L2270399, L2272864, L2277038, L2280498). All results were below LRLs, and so no inadvertent contamination occurred during sample collection or during transit.

D2.3 Data Precision

A total of 19 laboratory duplicate samples were used to evaluate laboratory precision (L2269908, L2270399, L2271140, L2271157, L2272864, L2273883, L2277038, L2278104, L2279040, L2280498, L2284959) totaling 187 individual results. All measurements were



within the laboratory DQO. This indicates that the laboratory analytical precision can be considered excellent.

Five sets of field duplicate samples were collected to assess the field sampling precision (Appendix Table D.2). Thirty comparisons (out of 455) had relative percent differences (RPD) that exceeded the DQO of 30% (6.7% of all pairs; Appendix Table D.2). Of these, 10 comparisons had data that were less than 5-times the LRL, and so failure to meet the DQO was likely the result of low measured concentrations. Failure to meet the DQO for a small portion of the QC results was not unexpected for multi-element scans, and is within the DQO (i.e., <20%; refer to section C1.1). As such, data were considered to have acceptable field precision and reproducibility.

D2.4 Data Accuracy

Data accuracy was evaluated based on results of Certified Reference Materials (CRM), Laboratory Control Samples (LCS), and Matrix Spikes (MS). All LCS (1,005 results) and CRM (12 results) analyses met the laboratory DQO. MS results for two of four RG_GO13 samples (Report L2272864, Lot 1090445; and L2270399, Lot 1087194), one RG_GC sample (report L2277038; Lot 1095183), and one RG_RGLK sample (L2270399, Lot 1087194) did not meet laboratory DQOs due to high analyte background. This included eight analytes for RG_GO13 (Al, Ba, Ca, Mg, Mn, Se, Na, Sr), and four analytes for RG_GC and RG_LNLK (Ba, Ca, Mg and Sr). Regardless, MS results met the laboratory DQO for all other samples collected for which concentrations of these analytes were not high relative to the MS, and so laboratory accuracy was considered acceptable.

D2.5 Hold Times

Recommended hold time for pH and ORP analysis was exceeded for all samples (15 minute hold time). Since *in situ* pH and ORP will be used for data interpretation, these exceedances have no impact on data interpretability. Additionally, one sample for total suspended solids (TSS), and one sample for turbidity also exceeded holding times (7 days for TSS, and 4 days for turbidity). However, excluding pH and ORP analyses, all samples were received by the laboratory more than one day before they exceeded their hold time. These exceedances will be considered when interpreting results.

D2.6 Data Quality Statement

Water chemistry data collected for the 2019 RSC Supporting Selenium Toxicity Study were of acceptable quality as characterized by good detectability, negligible analyte concentrations in blanks, as well as good precision and accuracy in both laboratory and field QC samples.



Therefore, the associated data can be used with a high level of confidence in the derivation of conclusions.



D3 REFERENCES

- BCMOE. 2018. Approved British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture – Summary Report. Updated March 2018. Available at: https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/wqgs-wqos/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf
- BCMOE. 2019. Working Water Quality Guidelines for British Columbia. Updated August 2019. https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf



Table D.1. Redside Shiner Supporting Selenium Toxicity Study Water Quality, May to June 2019

| Analyte | Units | RG_STPD | | |
|-----------------------------|---|---------------|------------|------------|
| | | Min | Max | |
| Physical Characteristics | Conductivity, Field | µS/cm | 253 | 333 |
| | Specific Conductivity, Field | µS/cm | 394 | 429 |
| | Conductivity, Lab | µS/cm | 387 | 427 |
| | Hardness (as CaCO ₃) | mg/L | 205 | 215 |
| | pH, Field ³ | pH | 7.7 | 8.4 |
| | pH, Lab | pH | 8.15 | 8.35 |
| | ORP, Lab | mV | 402 | 469 |
| | Total Suspended Solids, Lab | mg/L | <1.00 | 1.90 |
| | Total Dissolved Solids ² | mg/L | 223 | 243 |
| | Turbidity, Lab | NTU | 0.750 | 3.43 |
| Acidity and Alkalinity | Dissolved Oxygen-Field ⁴ | mg/L | 6.4 | 13 |
| | Dissolved Oxygen-Field | % | 49 | 144 |
| | Temperature-Field | °C | 3.4 | 16 |
| | Acidity (as CaCO ₃) | mg/L | <1.00 | 2.30 |
| | Alkalinity, Bicarbonate (as CaCO ₃) | mg/L | 140 | 161 |
| Anions and Nutrients | Alkalinity, Carbonate (as CaCO ₃) | mg/L | <1.00 | 3.20 |
| | Alkalinity, Hydroxide (as CaCO ₃) | mg/L | <1.00 | <1.00 |
| | Alkalinity, Total (as CaCO ₃) | mg/L | 140 | 162 |
| | Ammonia as N ⁵ | mg/L | <0.00500 | 0.0192 |
| | Bromide (Br) | mg/L | <0.0500 | <0.0500 |
| | Chloride (Cl) | mg/L | 2.45 | 7.44 |
| | Fluoride (F) ⁷ | mg/L | 0.131 | 0.171 |
| | Nitrate (as N) ² | mg/L | 0.134 | 0.868 |
| | Nitrite (as N) ⁶ | mg/L | 0.00410 | 0.00700 |
| | Total Kjeldahl Nitrogen | mg/L | 0.160 | 0.375 |
| Organic Carbon (Soil) | Orthophosphate-Dissolved (as P) | mg/L | <0.00100 | 0.00150 |
| | Phosphorus (P)-Total | mg/L | 0.00260 | 0.0116 |
| Organic Carbon (Soil) | Sulphate (SO ₄) ^{2,7} | mg/L | 48.2 | 60.9 |
| | Dissolved Organic Carbon | mg/L | 0.910 | 2.32 |
| Organic Carbon (Soil) | Total Organic Carbon | mg/L | 0.840 | 2.56 |
| | Total Metals | Aluminum (Al) | mg/L | 0.00350 |
| Antimony (Sb) | | mg/L | <0.000100 | 0.000150 |
| Arsenic (As) | | mg/L | 0.000140 | 0.000220 |
| Barium (Ba) | | mg/L | 0.0870 | 0.103 |
| Beryllium (Be) | | µg/L | <0.0200 | <0.0200 |
| Bismuth (Bi) | | mg/L | <0.0000500 | <0.0000500 |
| Boron (B) | | mg/L | <0.0100 | <0.0100 |
| Cadmium (Cd) | | µg/L | 0.00610 | 0.0149 |
| Calcium (Ca) | | mg/L | 51.8 | 57.5 |
| Chromium (Cr) ⁸ | | mg/L | 0.000150 | 0.000300 |
| Cobalt (Co) | | µg/L | <0.100 | 0.110 |
| Copper (Cu) | | mg/L | <0.000500 | <0.000500 |
| Iron (Fe) | | mg/L | 0.0210 | 0.0580 |
| Lead (Pb) ⁷ | | mg/L | <0.0000500 | <0.0000500 |
| Lithium (Li) | | mg/L | 0.00530 | 0.00670 |
| Magnesium (Mg) ⁷ | | mg/L | 15.2 | 18.9 |
| Manganese (Mn) | | mg/L | 0.00372 | 0.00676 |
| Mercury (Hg) ⁹ | | µg/L | <0.000500 | <0.000500 |
| Molybdenum (Mo) | | mg/L | 0.000884 | 0.000985 |
| Nickel (Ni) ⁷ | | mg/L | <0.000500 | 0.000510 |
| Potassium (K) | | mg/L | 0.476 | 0.620 |
| Selenium (Se) | | µg/L | 5.25 | 6.98 |
| Silicon (Si)-Total | | mg/L | 0.290 | 1.91 |
| Silver (Ag) ³ | | mg/L | <0.0000100 | <0.0000100 |
| Sodium (Na) | | mg/L | 2.91 | 5.52 |
| Strontium (Sr) | | mg/L | 0.166 | 0.187 |
| Thallium (Tl) | | mg/L | <0.0000100 | <0.0000100 |
| Tin (Sn) | | mg/L | <0.000100 | <0.000100 |
| Titanium (Ti) | | mg/L | <0.0100 | <0.0100 |
| Uranium (U) | | mg/L | 0.000854 | 0.000947 |
| Vanadium (V) | mg/L | <0.000500 | <0.000500 | |
| Zinc (Zn) ⁷ | mg/L | <0.00300 | 0.00380 | |
| Dissolved Metals | Aluminum (Al) | mg/L | <0.00300 | <0.00300 |
| | Antimony (Sb) | mg/L | <0.000100 | 0.000130 |
| | Arsenic (As) | mg/L | 0.000140 | 0.000210 |
| | Barium (Ba) | mg/L | 0.0879 | 0.103 |
| | Beryllium (Be) | µg/L | <0.0200 | <0.0200 |
| | Bismuth (Bi) | mg/L | <0.0000500 | <0.0000500 |
| | Boron (B) | mg/L | <0.0100 | <0.0100 |
| | Cadmium (Cd) ^{2,7} | µg/L | <0.00500 | 0.0104 |
| | Calcium (Ca) | mg/L | 54.0 | 56.7 |
| | Chromium (Cr) | mg/L | 0.000110 | 0.000160 |
| | Cobalt (Co) | µg/L | <0.100 | <0.100 |
| | Copper (Cu) | mg/L | <0.000500 | <0.000500 |
| | Iron (Fe) | mg/L | <0.0100 | <0.0100 |
| | Lead (Pb) | mg/L | <0.0000500 | <0.0000500 |
| | Lithium (Li) | mg/L | 0.00530 | 0.00590 |
| | Magnesium (Mg) | mg/L | 15.8 | 19.1 |
| | Manganese (Mn) | mg/L | <0.000100 | 0.000160 |
| | Mercury (Hg) | µg/L | <0.0000500 | <0.0000500 |
| | Molybdenum (Mo) | mg/L | 0.000867 | 0.000983 |
| | Nickel (Ni) | mg/L | <0.000500 | 0.000570 |
| | Potassium (K) | mg/L | 0.470 | 0.618 |
| | Selenium (Se) | µg/L | 5.64 | 7.41 |
| | Silicon (Si) | mg/L | 0.211 | 1.86 |
| | Silver (Ag) | mg/L | <0.0000100 | <0.0000100 |
| | Sodium (Na) | mg/L | 2.95 | 5.31 |
| | Strontium (Sr) | mg/L | 0.167 | 0.179 |
| | Thallium (Tl) | mg/L | <0.0000100 | <0.0000100 |
| | Tin (Sn) | mg/L | <0.000100 | <0.000100 |
| | Titanium (Ti) | mg/L | <0.0100 | <0.0100 |
| | Uranium (U) | mg/L | 0.000800 | 0.000999 |
| Vanadium (V) | mg/L | <0.000500 | <0.000500 | |
| Zinc (Zn) | mg/L | <0.00100 | 0.00170 | |

Value > GL
Value < LRL and LRL > GL

notes: "-" = no data

¹ Unless otherwise noted, British Columbia Working (BCMOE 2017) or Accepted (BCMOE 2019) Water Quality Guidelines for the Protection of Aquatic Life were used. For guidelines dependent on other analytes (e.g., hardness), guidelines were screened using concurrent values.

² When appropriate, site specific benchmarks were applied instead of BC water quality guidelines (Teck 2014)

³ Dissolved oxygen guidelines represent a minimum value, and so exceedances were quantified below this guideline.

⁴ Unrestricted change permitted within this pH range.

⁵ Temperature and pH dependent; range of minimum and maximum values.

⁶ Dependent on concurrent chloride, range of values reported (BCMOE 2017)

⁷ For hardness-based guidelines, concurrent hardness values were used for calculating guidelines. If hardness values exceeding the maximum applicable hardness, then guidelines were determined using the maximum applicable hardness.

⁸ Chromium(VI) is the dominant oxidation state in oxygenated environments, and so its guideline was applied.

⁹ A conservative guideline assuming 8% of total mercury is methyl-mercury (0.00125 µg/L) was applied.

¹⁰ In situ field measures were collected at RG_GO13 as part of the Lentic Area Supporting Study on May 13 and 16, 2019. Missing temperature and field pH for guideline screening were substituted with data collected on the nearest day.

¹¹ In situ field measures were collected at RG_GRLK as part of the Lentic Area Supporting Study on May 14, 2019. Missing temperature and field pH for guideline screening were substituted with data collected on the nearest day.

¹² Guidelines based on other concurrent water chemistry values and derived from the BC Biotic Ligand Model (BLM) (BCMOE 2019).

Table D.2: Water Chemistry Laboratory Reporting Limit (LRL) Evaluation Relative to Guidelines

| Parameter | Units | British Columbia Water Quality Guidelines ^a | | Maximum LRL |
|---|-------|--|---------|-------------|
| | | 30-Day | Maximum | |
| Anions, Organics, Nutrients, and Physical Properties | | | | |
| Conductivity (@ 25C) | uS/cm | - | - | 2.0 |
| Hardness (as CaCO3) | mg/L | - | - | 0.50 |
| Total Suspended Solids | mg/L | - | - | 1.0 |
| Total Dissolved Solids | mg/L | - | - | 20 |
| Turbidity | NTU | - | - | 0.10 |
| Acidity (as CaCO3) | mg/L | - | - | 1.0 |
| Alkalinity, Bicarbonate (as CaCO3) | mg/L | - | - | 1.0 |
| Alkalinity, Carbonate (as CaCO3) | mg/L | - | - | 1.0 |
| Alkalinity, Hydroxide (as CaCO3) | mg/L | - | - | 1.0 |
| Alkalinity, Total (as CaCO3) | mg/L | >20 | - | 1.0 |
| Ammonia as N ^b | mg/L | 0.102 | 0.752 | 0.0050 |
| Bromide (Br) | mg/L | - | - | 0.25 |
| Chloride (Cl) | mg/L | 150 | 600 | 2.5 |
| Fluoride (F) | mg/L | - | 1.7 | 0.10 |
| Nitrate (as N) | mg/L | 3.0 | 32.8 | 0.025 |
| Nitrite (as N) | mg/L | 0.2 | 0.6 | 0.0050 |
| Total Kjeldahl Nitrogen | mg/L | - | - | 0.050 |
| Orthophosphate-Dissolved (as P) | mg/L | - | - | 0.0010 |
| Phosphorus (P)-Total | mg/L | - | - | 0.01 |
| Sulfate (SO4) | mg/L | - | 429 | 1.5 |
| Dissolved Organic Carbon | mg/L | - | - | 0.50 |
| Total Organic Carbon | mg/L | - | - | 0.50 |
| Total Metals | | | | |
| Aluminum (Al)-Total | mg/L | - | - | 0.0030 |
| Antimony (Sb)-Total | mg/L | 0.009 | - | 0.00010 |
| Arsenic (As)-Total | mg/L | - | 0.0050 | 0.00010 |
| Barium (Ba)-Total | mg/L | 1 | - | 0.000 |
| Beryllium (Be)-Total | ug/L | 0.13 | - | 0.020 |
| Bismuth (Bi)-Total | mg/L | - | - | 0.000 |
| Boron (B)-Total | mg/L | 1.2 | - | 0.010 |
| Cadmium (Cd)-Total | ug/L | - | - | 0.005 |
| Calcium (Ca)-Total | mg/L | - | - | 0.050 |
| Chromium (Cr)-Total ^c | mg/L | 0.0010 | - | 0.00 |
| Cobalt (Co)-Total | ug/L | 4 | 110 | 0.10 |
| Copper (Cu)-Total | mg/L | - | - | 0.001 |
| Iron (Fe)-Total | mg/L | - | 1 | 0.010 |
| Lead (Pb)-Total ^d | mg/L | 0.0057 | 0.061 | 0.0001 |
| Lithium (Li)-Total | mg/L | - | - | 0.00 |
| Magnesium (Mg)-Total | mg/L | - | - | 0.10 |
| Manganese (Mn)-Total ^d | mg/L | 0.96 | 1.4 | 0.0001 |
| Mercury (Hg)-Total | ug/L | 0.01 | - | 0.0005 |
| Molybdenum (Mo)-Total | mg/L | 1 | 2 | 0.0001 |
| Nickel (Ni)-Total | ug/L | 80 | - | 0.001 |
| Potassium (K)-Total | mg/L | - | - | 0.050 |
| Selenium (Se)-Total | ug/L | 2 | - | 0.05 |
| Silicon (Si)-Total | mg/L | - | - | 0.10 |
| Silver (Ag)-Total ^d | mg/L | 0.00005 | 0.0001 | 0.00001 |
| Sodium (Na)-Total | mg/L | - | - | 0.050 |
| Strontium (Sr)-Total | mg/L | - | - | 0.0002 |
| Thallium (Tl)-Total | mg/L | - | - | 0.00001 |
| Tin (Sn)-Total | mg/L | - | - | 0.000 |
| Titanium (Ti)-Total | mg/L | - | - | 0.010 |
| Uranium (U)-Total | mg/L | - | - | 0.0000 |
| Vanadium (V)-Total | mg/L | - | - | 0.0005 |
| Zinc (Zn)-Total ^d | mg/L | 0.0075 | 0.033 | 0.0030 |
| Dissolved Metals | | | | |
| Aluminum (Al)-Dissolved ^f | mg/L | 0.05 | 0.1 | 0.0030 |
| Antimony (Sb)-Dissolved | mg/L | - | - | 0.00010 |
| Arsenic (As)-Dissolved | mg/L | - | - | 0.00010 |
| Barium (Ba)-Dissolved | mg/L | - | - | 0.000 |
| Beryllium (Be)-Dissolved | ug/L | - | - | 0.020 |
| Bismuth (Bi)-Dissolved | mg/L | - | - | 0.000 |
| Boron (B)-Dissolved | mg/L | - | - | 0.010 |
| Cadmium (Cd)-Dissolved ^d | ug/L | 0.18 | 0.47 | 0.005 |
| Calcium (Ca)-Dissolved | mg/L | - | - | 0.050 |
| Chromium (Cr)-Dissolved | mg/L | - | - | 0.00 |
| Cobalt (Co)-Dissolved | ug/L | - | - | 0.10 |
| Copper (Cu)-Dissolved ^g | mg/L | 0.0002 | 0.012 | 0.0005 |
| Iron (Fe)-Dissolved | mg/L | - | 0.35 | 0.010 |
| Lead (Pb)-Dissolved | mg/L | - | - | 0.0001 |
| Lithium (Li)-Dissolved | mg/L | - | - | 0.00 |
| Magnesium (Mg)-Dissolved | mg/L | - | - | 0.10 |
| Manganese (Mn)-Dissolved | mg/L | - | - | 0.00010 |
| Mercury (Hg)-Dissolved | mg/L | - | - | 0.00001 |
| Molybdenum (Mo)-Dissolved | mg/L | - | - | 0.00005 |
| Nickel (Ni)-Dissolved | mg/L | - | - | 0.001 |
| Potassium (K)-Dissolved | mg/L | - | - | 0.050 |
| Selenium (Se)-Dissolved | ug/L | - | - | 0.050 |
| Silicon (Si)-Dissolved | mg/L | - | - | 0.050 |
| Silver (Ag)-Dissolved | mg/L | - | - | 0.000 |
| Sodium (Na)-Dissolved | mg/L | - | - | 0.050 |
| Strontium (Sr)-Dissolved | mg/L | - | - | 0.00020 |
| Thallium (Tl)-Dissolved | mg/L | - | - | 0.00001 |
| Tin (Sn)-Dissolved | mg/L | - | - | 0.000 |
| Titanium (Ti)-Dissolved | mg/L | - | - | 0.010 |
| Uranium (U)-Dissolved | mg/L | - | - | 0.00001 |
| Vanadium (V)-Dissolved | mg/L | - | - | 0.0005 |
| Zinc (Zn)-Dissolved | mg/L | - | - | 0.0010 |

Shading indicates a concentration greater than the lowest guideline.

^a British Columbia Water Quality Guidelines for the protection of Aquatic Life (BCMOE 2018, 2019).

^b Based on most conservative guideline using highest temperature (20) and pH (9).

^c Minimum water quality guidelines for Nitrite (as N) reported in BCMOE (2018) for chloride concentrations < 2 mg/L.

^d Hardness-based guidelines calculated using the minimum hardness observed for all samples (79.7 mg/L).

^e Guideline for Chromium VI (0.001 mg/L) was selected, as this is the principal species found in surface waters.

^f Based on guideline considering a median pH >6.5. Median field pH was >6.5.

^g Copper GLs were calculated using the BC Biotic Ligand Model Software (BLM) (BCMOE 2019).

Table D.3: Field Duplicate Results for Water Chemistry, Elk Valley, May 2019

| Parameter | Units | RG_ER | RG_DUP | RPD (%) | RG_EROL | RG_DUP | RPD (%) |
|---|-------|------------|------------|---------|------------|------------|---------|
| | | 21-May-19 | 21-May-19 | | 27-May-19 | 27-May-19 | |
| | | 10:26 | 10:26 | | 15:30 | 15:45 | |
| Physical Tests (Water) | | | | | | | |
| Conductivity (@ 25C) | uS/cm | 304 | 253 | 18 | 384 | 403 | 4.8 |
| Hardness (as CaCO3) | mg/L | 128 | 120 | 6.5 | 213 | 210 | 1.4 |
| pH, lab | pH | 8.23 | 8.16 | 0.85 | 8.3 | 8.34 | 0.48 |
| ORP, lab | mV | 442 | 425 | 3.9 | 396 | 383 | 3.3 |
| Total Suspended Solids | mg/L | 23.4 | 19.3 | 19 | 1 | 1.1 | 9.5 |
| Total Dissolved Solids | mg/L | 165 | 134 | 21 | 213 | 229 | 7.2 |
| Turbidity | NTU | 17.3 | 11.9 | 37 | 0.31 | 0.29 | 6.7 |
| Anions and Nutrients (Water) | | | | | | | |
| Acidity (as CaCO3) | mg/L | 1 | 1.2 | 18 | 2.2 | 2.3 | 4.4 |
| Alkalinity, Bicarbonate (as CaCO3) | mg/L | 142 | 115 | 21 | 191 | 179 | 6.5 |
| Alkalinity, Carbonate (as CaCO3) | mg/L | <1.0 | <1.0 | - | 1 | 2 | 67 |
| Alkalinity, Hydroxide (as CaCO3) | mg/L | <1.0 | <1.0 | - | <1.0 | <1.0 | - |
| Alkalinity, Total (as CaCO3) | mg/L | 142 | 115 | 21 | 191 | 181 | 5.4 |
| Ammonia as N | mg/L | 0.005 | 0.0063 | 23 | 0.0903 | 0.0057 | 176 |
| Bromide (Br) | mg/L | <0.050 | <0.050 | - | <0.050 | <0.050 | - |
| Chloride (Cl) | mg/L | 3.18 | 2.23 | 35 | 2.74 | 3.69 | 30 |
| Fluoride (F) | mg/L | 0.091 | 0.082 | 10 | 0.1 | 0.121 | 19 |
| Nitrate (as N) | mg/L | 0.269 | 0.316 | 16 | 0.2 | 0.312 | 44 |
| Nitrite (as N) | mg/L | <0.0010 | <0.0010 | - | 0.0012 | 0.0015 | 22 |
| Total Kjeldahl Nitrogen | mg/L | 0.118 | 0.101 | 16 | 0.146 | 0.087 | 51 |
| Orthophosphate-Dissolved (as P) | mg/L | 0.007 | 0.0035 | 67 | <0.0010 | <0.0010 | - |
| Phosphorus (P)-Total | mg/L | 0.0199 | 0.0272 | 31 | 0.0078 | 0.0044 | 56 |
| Sulfate (SO4) | mg/L | 16.5 | 17.9 | 8.1 | 17.6 | 30.4 | 53 |
| Organic / Inorganic Carbon (Water) | | | | | | | |
| Dissolved Organic Carbon | mg/L | 1.95 | 1.92 | 1.6 | 0.56 | 0.72 | 25 |
| Total Organic Carbon | mg/L | 2.25 | 2.17 | 3.6 | 0.69 | 0.78 | 12 |
| Total Metals (Water) | | | | | | | |
| Aluminum (Al)-Total | mg/L | 0.273 | 0.452 | 49 | 0.0081 | 0.0032 | 87 |
| Antimony (Sb)-Total | mg/L | <0.00010 | <0.00010 | - | <0.00010 | <0.00010 | - |
| Arsenic (As)-Total | mg/L | 0.00055 | 0.00058 | 5.3 | 0.00014 | 0.00014 | 0 |
| Barium (Ba)-Total | mg/L | 0.0542 | 0.0514 | 5.3 | 0.108 | 0.107 | 0.93 |
| Beryllium (Be)-Total | ug/L | 0.02 | 0.025 | 22 | <0.020 | <0.020 | - |
| Bismuth (Bi)-Total | mg/L | <0.000050 | <0.000050 | - | <0.000050 | <0.000050 | - |
| Boron (B)-Total | mg/L | <0.010 | <0.010 | - | <0.010 | <0.010 | - |
| Cadmium (Cd)-Total | ug/L | 0.0127 | 0.0131 | 3.1 | 0.0091 | 0.0088 | 3.4 |
| Calcium (Ca)-Total | mg/L | 34.9 | 34.2 | 2.0 | 62.4 | 58.4 | 6.6 |
| Chromium (Cr)-Total | mg/L | 0.00042 | 0.00066 | 44 | 0.00028 | 0.00025 | 11 |
| Cobalt (Co)-Total | ug/L | 0.2 | 0.31 | 43 | <0.10 | <0.10 | - |
| Copper (Cu)-Total | mg/L | 0.00097 | 0.00121 | 22 | <0.00050 | <0.00050 | - |
| Iron (Fe)-Total | mg/L | 0.314 | 0.563 | 57 | 0.025 | 0.02 | 22 |
| Lead (Pb)-Total | mg/L | 0.000376 | 0.000623 | 49 | <0.000050 | <0.000050 | - |
| Lithium (Li)-Total | mg/L | 0.0024 | 0.0025 | 4.1 | 0.0039 | 0.004 | 2.5 |
| Magnesium (Mg)-Total | mg/L | 12.5 | 11.8 | 5.8 | 15.2 | 15.1 | 0.66 |
| Manganese (Mn)-Total | mg/L | 0.0145 | 0.0219 | 41 | 0.00437 | 0.00384 | 13 |
| Mercury (Hg)-Total | ug/L | 0.00101 | 0.00147 | 37 | <0.00050 | <0.00050 | - |
| Molybdenum (Mo)-Total | mg/L | 0.000568 | 0.000512 | 10 | 0.000614 | 0.000619 | 0.81 |
| Nickel (Ni)-Total | mg/L | 0.0005 | 0.00073 | 37 | <0.00050 | <0.00050 | - |
| Potassium (K)-Total | mg/L | 0.887 | 0.832 | 6.4 | 0.534 | 0.534 | 0 |
| Selenium (Se)-Total | ug/L | 0.955 | 0.988 | 3.4 | 2.52 | 2.68 | 6.2 |
| Silicon (Si)-Total | mg/L | 3.53 | 3.55 | 0.56 | 2.24 | 2.24 | 0 |
| Silver (Ag)-Total | mg/L | <0.000010 | <0.000010 | - | <0.000010 | <0.000010 | - |
| Sodium (Na)-Total | mg/L | 3.97 | 3.36 | 17 | 3.2 | 3.14 | 1.9 |
| Strontium (Sr)-Total | mg/L | 0.121 | 0.118 | 2.5 | 0.133 | 0.15 | 12 |
| Thallium (Tl)-Total | mg/L | <0.000010 | <0.000010 | - | <0.000010 | <0.000010 | - |
| Tin (Sn)-Total | mg/L | <0.00010 | <0.00010 | - | <0.00010 | <0.00010 | - |
| Titanium (Ti)-Total | mg/L | <0.010 | <0.010 | - | <0.010 | <0.010 | - |
| Uranium (U)-Total | mg/L | 0.001 | 0.000925 | 7.8 | 0.000514 | 0.000547 | 6.2 |
| Vanadium (V)-Total | mg/L | 0.00071 | 0.0009 | 24 | <0.00050 | <0.00050 | - |
| Zinc (Zn)-Total | mg/L | 0.0045 | 0.0046 | 2.2 | 0.0059 | 0.003 | 65 |
| Dissolved Metals (Water) | | | | | | | |
| Aluminum (Al)-Dissolved | mg/L | 0.01 | 0.0103 | 3.0 | <0.0030 | <0.0030 | - |
| Antimony (Sb)-Dissolved | mg/L | <0.00010 | <0.00010 | - | <0.00010 | <0.00010 | - |
| Arsenic (As)-Dissolved | mg/L | 0.0004 | 0.0004 | 0 | 0.00015 | 0.00014 | 6.9 |
| Barium (Ba)-Dissolved | mg/L | 0.0541 | 0.0504 | 7.1 | 0.102 | 0.101 | 1.0 |
| Beryllium (Be)-Dissolved | ug/L | <0.020 | <0.020 | - | <0.020 | <0.020 | - |
| Bismuth (Bi)-Dissolved | mg/L | <0.000050 | <0.000050 | - | <0.000050 | <0.000050 | - |
| Boron (B)-Dissolved | mg/L | <0.010 | <0.010 | - | <0.010 | <0.010 | - |
| Cadmium (Cd)-Dissolved | ug/L | <0.0050 | <0.0050 | - | 0.0071 | 0.0086 | 19 |
| Calcium (Ca)-Dissolved | mg/L | 31.7 | 29.7 | 6.5 | 61 | 61 | 0 |
| Chromium (Cr)-Dissolved | mg/L | <0.00010 | <0.00010 | - | 0.00024 | 0.00022 | 8.7 |
| Cobalt (Co)-Dissolved | ug/L | <0.10 | <0.10 | - | <0.10 | <0.10 | - |
| Copper (Cu)-Dissolved | mg/L | <0.00050 | <0.00050 | - | <0.00050 | <0.00050 | - |
| Iron (Fe)-Dissolved | mg/L | <0.010 | <0.010 | - | <0.010 | <0.010 | - |
| Lead (Pb)-Dissolved | mg/L | <0.000050 | <0.000050 | - | <0.000050 | <0.000050 | - |
| Lithium (Li)-Dissolved | mg/L | 0.0017 | 0.0016 | 6.1 | 0.0038 | 0.004 | 5.1 |
| Magnesium (Mg)-Dissolved | mg/L | 11.9 | 11.2 | 6.1 | 14.7 | 14 | 4.9 |
| Manganese (Mn)-Dissolved | mg/L | 0.00285 | 0.00225 | 24 | 0.00318 | 0.00252 | 23 |
| Mercury (Hg)-Dissolved | mg/L | <0.0000050 | <0.0000050 | - | <0.0000050 | <0.0000050 | - |
| Molybdenum (Mo)-Dissolved | mg/L | 0.000553 | 0.000533 | 3.7 | 0.000583 | 0.000586 | 0.51 |
| Nickel (Ni)-Dissolved | mg/L | <0.00050 | <0.00050 | - | <0.00050 | <0.00050 | - |
| Potassium (K)-Dissolved | mg/L | 0.746 | 0.685 | 8.5 | 0.509 | 0.498 | 2.2 |
| Selenium (Se)-Dissolved | ug/L | 0.999 | 1.02 | 2.1 | 2.25 | 2.49 | 10 |
| Silicon (Si)-Dissolved | mg/L | 2.87 | 2.7 | 6.1 | 2.28 | 2.23 | 2.2 |
| Silver (Ag)-Dissolved | mg/L | <0.000010 | <0.000010 | - | <0.000010 | <0.000010 | - |
| Sodium (Na)-Dissolved | mg/L | 3.7 | 3.36 | 9.6 | 3.03 | 3.14 | 3.6 |
| Strontium (Sr)-Dissolved | mg/L | 0.114 | 0.108 | 5.4 | 0.132 | 0.14 | 5.9 |
| Thallium (Tl)-Dissolved | mg/L | <0.000010 | <0.000010 | - | <0.000010 | <0.000010 | - |
| Tin (Sn)-Dissolved | mg/L | <0.00010 | <0.00010 | - | <0.00010 | <0.00010 | - |
| Titanium (Ti)-Dissolved | mg/L | <0.010 | <0.010 | - | <0.010 | <0.010 | - |
| Uranium (U)-Dissolved | mg/L | 0.000883 | 0.000826 | 6.7 | 0.000504 | 0.000561 | 11 |
| Vanadium (V)-Dissolved | mg/L | <0.00050 | <0.00050 | - | <0.00050 | <0.00050 | - |
| Zinc (Zn)-Dissolved | mg/L | 0.0013 | 0.0011 | 17 | 0.0011 | 0.001 | 9.5 |

Notes: RPD was calculated using < Laboratory Reporting Limit (LRL) results at the LRL if one result in a duplicate pair was below the LRL. RPD was not calculated if both results were < LRL.

- Data were reported as <LRL, and the LRL is reported in the table.
- Highlighted values did not meet the data quality objective of ≤ 30% Relative Percent Difference (RPD).

Table D.4: Angling Catch and Catch-Per-Unit-Effort, May 2019

| Area Type | Area Description | Area Code | Net ID | UTM (NAD83, Zone 11U) | | Date | Start Time | End Time | Fishing Hours | Effort (Fishing Days) | Redside Shiner | | | | | |
|--------------|------------------|-----------|------------|--------------------------|----------|-----------|------------|----------|------------------|-----------------------------|----------------|--------------|------------|-------------|------------|-------------------|
| | | | | Easting | Northing | | | | | | Total Catch | Female Catch | Male Catch | Mortalities | Sacrificed | CPUE ^a |
| Reference | Loon Lake | RG_LNLK | LNLK-AN-01 | 638585 | 5442223 | 10-May-19 | 14:28 | 15:30 | 1.03 | 0.04 | 15 | 6 | 9 | 0 | 0 | 15 |
| | | | LNLK-AN-02 | 638569 | 5442211 | 11-May-19 | 9:50 | 10:35 | 0.75 | 0.03 | 28 | nd | nd | 0 | 10 | 37 |
| | | | LNLK-AN-03 | 638569 | 5542211 | 16-May-19 | 9:45 | 10:45 | 1.75 | 0.07 | 42 | 23 | 19 | 0 | 0 | 24 |
| Total | | | | | | | | | 3.53 | 0.15 | 85 | nd | nd | 0 | 10 | 24 |

Notes: ID = identifier; UTM = Universal Transverse Mercator; NAD = North American Datum; CPUE = catch-per-unit-effort, nd = not determined.

^a CPUE calculated as: (# fish caught/hours)

Table D.5: Gill Net Catch and Catch-Per-Unit-Effort Data, May-June, 2019

| Area Type | Area Description | Area Code | Net ID | UTM (NAD83, Zone 11U) | | Depth Range (m) | Set Date | Lift Date | Set Time | Lift Time | Effort (Fishing Hours) | |
|--------------|---|-----------|----------|--------------------------|----------|--------------------|----------|-----------|-----------|-----------|---------------------------|-------|
| | | | | Easting | Northing | | | | | | | |
| Mine-exposed | Koochanusa Reservoir (Englishman Creek) | RG_ER | ER-GN-01 | 626926 | 5446717 | 0 | 4 | 27-May-19 | 27-May-19 | 10:55 | 11:10 | 0.25 |
| | | | ER-GN-02 | 626803 | 5446619 | 0 | 3 | 27-May-19 | 27-May-19 | 11:25 | 11:40 | 0.25 |
| | | | ER-GN-03 | 626915 | 5446769 | 0 | 1.5 | 27-May-19 | 27-May-19 | 13:05 | 13:20 | 0.25 |
| | | | ER-GN-04 | 626915 | 5446769 | 0 | 3 | 27-May-19 | 27-May-19 | 13:25 | 13:40 | 0.25 |
| | | | ER-GN-05 | 626915 | 5446769 | 0 | 3 | 27-May-19 | 27-May-19 | 14:25 | 14:40 | 0.25 |
| | | | ER-GN-06 | 626915 | 5446769 | 0 | 3 | 27-May-19 | 27-May-19 | 14:45 | 15:00 | 0.25 |
| | | | ER-GN-07 | 626915 | 5446769 | 0 | 3 | 27-May-19 | 27-May-19 | 15:05 | 15:15 | 0.17 |
| | | | ER-GN-08 | 626915 | 5446769 | 0 | 3 | 27-May-19 | 27-May-19 | 15:20 | 15:50 | 0.50 |
| | | | ER-GN-09 | 626912 | 5446686 | 0 | 2 | 29-May-19 | 29-May-19 | 12:40 | 12:55 | 0.25 |
| | | | ER-GN-10 | 626912 | 5446686 | 0 | 2 | 29-May-19 | 29-May-19 | 13:00 | 13:15 | 0.25 |
| | | | ER-GN-11 | 626912 | 5446686 | 0 | 2 | 29-May-19 | 29-May-19 | 13:20 | 13:35 | 0.25 |
| | | | ER-GN-12 | 626912 | 5446686 | 0 | 1.5 | 29-May-19 | 29-May-19 | 13:45 | 14:10 | 0.42 |
| | | | ER-GN-13 | 626912 | 5446686 | 0 | 1.5 | 30-May-19 | 30-May-19 | 12:00 | 12:15 | 0.25 |
| | | | ER-GN-14 | 626912 | 5446686 | 0 | 1.5 | 30-May-19 | 30-May-19 | 12:20 | 12:35 | 0.25 |
| | | | ER-GN-15 | 626912 | 5446686 | 0 | 1.5 | 30-May-19 | 30-May-19 | 12:50 | 13:10 | 0.33 |
| | | | ER-GN-16 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:00 | 12:10 | 0.17 |
| | | | ER-GN-17 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:15 | 12:20 | 0.083 |
| | | | ER-GN-18 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:25 | 12:40 | 0.25 |
| | | | ER-GN-19 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:45 | 12:55 | 0.17 |
| | | | ER-GN-20 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:55 | 13:05 | 0.17 |
| | | | ER-GN-21 | 626803 | 5446619 | 0 | 6 | 1-Jun-19 | 1-Jun-19 | 13:15 | 13:25 | 0.17 |
| | | | ER-GN-22 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:15 | 12:20 | 0.08 |
| | | | ER-GN-23 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:25 | 12:40 | 0.25 |
| | | | ER-GN-24 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:45 | 12:55 | 0.17 |
| | | | ER-GN-25 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 12:55 | 13:05 | 0.17 |
| | | | ER-GN-26 | 626803 | 5446619 | 0 | 6 | 1-Jun-19 | 1-Jun-19 | 13:15 | 13:25 | 0.17 |
| | | | ER-GN-27 | 626926 | 5446717 | 0 | 2 | 1-Jun-19 | 1-Jun-19 | 13:25 | 13:40 | 0.25 |
| | | | ER-GN-28 | 626955 | 5446686 | 0.5 | 4 | 3-Jun-19 | 3-Jun-19 | 12:40 | 12:55 | 0.25 |
| | | | ER-GN-29 | 626977 | 5446822 | 0.5 | 4 | 3-Jun-19 | 3-Jun-19 | 13:00 | 13:15 | 0.25 |
| | | | ER-GN-30 | 627000 | 5446710 | 0.5 | 1.5 | 3-Jun-19 | 3-Jun-19 | 14:00 | 14:15 | 0.25 |
| | | | ER-GN-31 | 622053 | 5446943 | 0.5 | 2 | 3-Jun-19 | 3-Jun-19 | 14:25 | 14:40 | 0.25 |
| | | | ER-GN-32 | 626956 | 5446680 | 0.5 | 2 | 6-Jun-19 | 6-Jun-19 | 14:30 | 14:45 | 0.25 |
| | | | ER-GN-33 | 622061 | 5446940 | 0.5 | 1.5 | 6-Jun-19 | 6-Jun-19 | 14:55 | 15:10 | 0.25 |
| | | | ER-GN-34 | 627001 | 5446882 | 0.3 | 2.5 | 11-Jun-19 | 11-Jun-19 | 13:00 | 13:15 | 0.25 |
| | | | ER-GN-35 | 626994 | 5448894 | 0.3 | 5 | 13-Jun-19 | 13-Jun-19 | 10:11 | 10:29 | 0.30 |
| | | | ER-GN-36 | 627014 | 5448926 | 0.3 | 5 | 13-Jun-19 | 13-Jun-19 | 10:30 | 10:45 | 0.25 |
| | | | ER-GN-37 | 627062 | 5446946 | 0.3 | 5 | 13-Jun-19 | 13-Jun-19 | 11:15 | 11:35 | 0.33 |
| | | | ER-GN-38 | 627069 | 5446973 | 0.3 | 5 | 13-Jun-19 | 13-Jun-19 | 12:00 | 12:15 | 0.25 |
| | | | ER-GN-39 | 627058 | 5446961 | 0.3 | 2 | 13-Jun-19 | 13-Jun-19 | 12:30 | 12:45 | 0.25 |
| | | | ER-GN-40 | 627069 | 5446997 | 0.1 | 2 | 13-Jun-19 | 13-Jun-19 | 13:00 | 13:15 | 0.25 |
| | | | ER-GN-41 | 627050 | 5446941 | 0.5 | 5 | 14-Jun-19 | 14-Jun-19 | 10:00 | 10:55 | 0.92 |
| | | | ER-GN-42 | 627050 | 5446941 | 0.5 | 5 | 14-Jun-19 | 14-Jun-19 | 11:20 | 11:35 | 0.25 |
| | | | ER-GN-43 | 627050 | 5446941 | 0.5 | 5 | 14-Jun-19 | 14-Jun-19 | 11:50 | 12:05 | 0.25 |
| | | | ER-GN-44 | 627050 | 5446941 | 0.5 | 5 | 14-Jun-19 | 14-Jun-19 | 12:30 | 12:45 | 0.25 |
| | | | ER-GN-45 | 627050 | 5446941 | 0.5 | 5 | 14-Jun-19 | 14-Jun-19 | 13:10 | 13:25 | 0.25 |
| | | | ER-GN-46 | 627016 | 5446917 | 0.1 | 2 | 15-Jun-19 | 15-Jun-19 | 12:58 | 13:10 | 0.20 |
| | | | ER-GN-47 | 627049 | 5446934 | 0.1 | 3 | 15-Jun-19 | 15-Jun-19 | 13:27 | 13:40 | 0.22 |
| | | | ER-GN-48 | 626986 | 5446863 | 0.3 | 2 | 19-Jun-19 | 19-Jun-19 | 10:50 | 11:05 | 0.25 |
| | | | ER-GN-49 | 626986 | 5446863 | 0.3 | 2.5 | 19-Jun-19 | 19-Jun-19 | 11:30 | 11:45 | 0.25 |
| | | | ER-GN-50 | 627051 | 5446955 | 0.3 | 5 | 20-Jun-19 | 20-Jun-19 | 11:00 | 13:00 | 2.0 |
| | | | ER-GN-51 | 622416 | 5443099 | 0.3 | 3 | 20-Jun-19 | 20-Jun-19 | 13:10 | 13:37 | 0.45 |
| | | | ER-GN-52 | 627009 | 5446876 | 0.3 | 3 | 21-Jun-19 | 21-Jun-19 | 9:10 | 11:10 | 2.0 |
| Total | | | | | | | | | | | 17 | |
| | Koochanusa Reservoir (Gold Creek) | RG_GC | GC-GN-01 | 629803 | 5436683 | 0 | 5 | 27-May-19 | 27-May-19 | 13:40 | 13:50 | 0.17 |
| | | | GC-GN-02 | 630220 | 5436848 | 0 | 1.5 | 27-May-19 | 27-May-19 | 13:50 | 14:00 | 0.17 |
| | | | GC-GN-03 | 629348 | 5436520 | 0 | 1.5 | 28-May-19 | 28-May-19 | 9:20 | 9:40 | 0.33 |
| | | | GC-GN-04 | 629348 | 5436520 | 0 | 1.5 | 28-May-19 | 28-May-19 | 9:40 | 10:00 | 0.33 |
| | | | GC-GN-05 | 629348 | 5436520 | 0 | 1.5 | 28-May-19 | 28-May-19 | 10:05 | 10:15 | 0.17 |
| | | | GC-GN-06 | 629348 | 5436520 | 0 | 1.5 | 28-May-19 | 28-May-19 | 10:15 | 10:30 | 0.25 |
| | | | GC-GN-07 | 629740 | 5436622 | 0 | 1.5 | 28-May-19 | 28-May-19 | 10:40 | 10:55 | 0.25 |
| | | | GC-GN-08 | 629740 | 5436622 | 0 | 1.5 | 28-May-19 | 28-May-19 | 11:00 | 11:15 | 0.25 |
| | | | GC-GN-09 | 629740 | 5436622 | 0 | 1.5 | 28-May-19 | 28-May-19 | 11:20 | 11:35 | 0.25 |
| | | | GC-GN-10 | 629302 | 5436632 | 0 | 2 | 28-May-19 | 28-May-19 | 11:40 | 11:50 | 0.17 |
| | | | GC-GN-11 | 629583 | 5437416 | 0 | 1.5 | 29-May-19 | 29-May-19 | 9:20 | 9:40 | 0.33 |
| | | | GC-GN-12 | 629616 | 5437407 | 0 | 2 | 29-May-19 | 29-May-19 | 9:50 | 10:15 | 0.42 |
| | | | GC-GN-13 | 629676 | 5437385 | - | - | 29-May-19 | 29-May-19 | 10:25 | 10:35 | 0.17 |
| | | | GC-GN-14 | 629658 | 5437389 | - | - | 29-May-19 | 29-May-19 | 10:40 | 10:55 | 0.25 |
| | | | GC-GN-15 | 629460 | 5430550 | 0.5 | 3 | 21-Jun-19 | 21-Jun-19 | 14:10 | 14:36 | 0.43 |
| | | | GC-GN-16 | 628834 | 5436581 | 1 | 4 | 22-Jun-19 | 22-Jun-19 | 9:07 | 9:23 | 0.27 |
| | | | GC-GN-17 | 628946 | 5436541 | 0 | 4 | 22-Jun-19 | 22-Jun-19 | 9:32 | 9:49 | 0.28 |
| | | | GC-GN-18 | 629140 | 543624 | 0 | 4 | 22-Jun-19 | 22-Jun-19 | 10:15 | 10:32 | 0.28 |
| | | | GC-GN-19 | 629187 | 5436449 | 0 | 4 | 22-Jun-19 | 22-Jun-19 | 11:17 | 11:31 | 0.23 |
| | | | GC-GN-20 | 692878 | 5436703 | 0.5 | 3 | 22-Jun-19 | 22-Jun-19 | 11:52 | 12:10 | 0.30 |
| | | | GC-GN-21 | 692878 | 546703 | 0.5 | 3 | 22-Jun-19 | 22-Jun-19 | 13:15 | 13:32 | 0.28 |
| | | | GC-GN-22 | 628757 | 5436690 | 0.6 | 3 | 22-Jun-19 | 22-Jun-19 | 13:48 | 14:02 | 0.23 |
| | | | GC-GN-23 | 628740 | 5436676 | 0.5 | 3 | 22-Jun-19 | 22-Jun-19 | 14:27 | 14:40 | 0.22 |
| | | | GC-GN-24 | 629460 | 5436550 | 0.5 | 3 | 23-Jun-19 | 23-Jun-19 | 9:07 | 10:22 | 1.2 |
| | | | GC-GN-25 | 629009 | 5436565 | 0.2 | 2.5 | 24-Jun-19 | 24-Jun-19 | 9:10 | 9:55 | 0.75 |
| Total | | | | | | | | | | | 8.0 | |

Notes: ID = identifier; UTM = Universal Transverse Mercator; NAD = North American Datum; m = meters; ft = feet; CPUE = catch-per-unit-effort; nd = not detected
^a CPUE calculated as: (# fish caught)/(ft² x hours))

Table D.5: Gill Net Catch and Catch

| Area Type | Area Description | Area Code | Set Information | | | Net Area (ft ²) | Redside Shiner | | | | | | Peamouth Chub | | | | |
|----------------------------------|--|-----------|-----------------------|-----------------------|---------------|-----------------------------|----------------|-------------|------------|------------------|------------|------------|---------------|------------|-------------|------------|------------------|
| | | | Net Panel Length (ft) | Net Panel Height (ft) | Mesh (inches) | | Catch | Mortalities | Sacrificed | CPU ^a | Male | Female | Juvenile | Catch | Mortalities | Sacrificed | CPU ^a |
| Mine-exposed | Kooconusa Reservoir (Englishman Creek) | RG_ER | 50 | 6 | 1 | 300 | 13 | 0 | 0 | 0.17 | 8 | 4 | 1 | 9 | 0 | 0 | 0.12 |
| | | | 50 | 6 | 1 | 300 | 28 | 0 | 0 | 0.37 | 16 | 8 | 4 | 3 | 0 | 0 | 0.040 |
| | | | 50 | 6 | 1 | 300 | 7 | 0 | 0 | 0.093 | 3 | 4 | 0 | 5 | 0 | 0 | 0.067 |
| | | | 50 | 6 | 1 | 300 | 43 | 0 | 0 | 0.57 | 21 | 20 | 2 | 2 | 0 | 0 | 0.027 |
| | | | 50 | 6 | 1 | 300 | 2 | 0 | 0 | 0.027 | nd | nd | nd | 15 | 0 | 0 | 0.20 |
| | | | 50 | 6 | 1 | 300 | 17 | 0 | 0 | 0.23 | nd | nd | nd | 1 | 0 | 0 | 0.013 |
| | | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.020 | nd | nd | nd | 4 | 0 | 0 | 0.080 |
| | | | 50 | 6 | 1 | 300 | 48 | 0 | 0 | 0.32 | nd | nd | nd | 9 | 0 | 0 | 0.060 |
| | | | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.040 | nd | nd | nd | 2 | 0 | 0 | 0.027 |
| | | | 50 | 6 | 1 | 300 | 9 | 0 | 0 | 0.12 | 3 | 6 | 0 | 3 | 0 | 0 | 0.040 |
| | | | 50 | 6 | 1 | 300 | 9 | 0 | 0 | 0.12 | 4 | 5 | 0 | 5 | 0 | 0 | 0.067 |
| | | | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.024 | nd | nd | nd | 7 | 0 | 0 | 0.056 |
| | | | 50 | 6 | 1 | 300 | 11 | 0 | 0 | 0.15 | 5 | 6 | 0 | 2 | 0 | 0 | 0.027 |
| | | | 50 | 6 | 1 | 300 | 57 | 0 | 0 | 0.76 | 30 | 27 | 0 | 8 | 0 | 0 | 0.11 |
| | | | 50 | 6 | 1 | 300 | 63 | 0 | 0 | 0.63 | 29 | 24 | 0 | 20 | 0 | 0 | 0.20 |
| | | | 50 | 6 | 1 | 300 | 4 | 0 | 0 | 0.080 | nd | nd | nd | 2 | 0 | 0 | 0.040 |
| | | | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.12 | nd | nd | nd | 6 | 0 | 0 | 0.24 |
| | | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.013 | nd | nd | nd | 10 | 0 | 0 | 0.13 |
| | | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.060 |
| | | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.020 | nd | nd | nd | 12 | 0 | 0 | 0.24 |
| | | | 50 | 6 | 1 | 300 | 6 | 0 | 0 | 0.12 | nd | nd | nd | 6 | 0 | 0 | 0.12 |
| | | | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.12 | nd | nd | nd | 6 | 0 | 0 | 0.24 |
| | | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.013 | nd | nd | nd | 10 | 0 | 0 | 0.13 |
| | | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.060 |
| | | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.020 | nd | nd | nd | 12 | 0 | 0 | 0.24 |
| | | | 50 | 6 | 1 | 300 | 6 | 0 | 0 | 0.12 | nd | nd | nd | 6 | 0 | 0 | 0.12 |
| | | | 50 | 6 | 1 | 300 | 6 | 0 | 0 | 0.080 | nd | nd | nd | 7 | 0 | 0 | 0.093 |
| | | | 50 | 6 | 1 | 300 | 5 | 0 | 0 | 0.067 | 2 | 3 | 0 | 0 | 0 | 0 | 0 |
| | | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 50 | 6 | 1 | 300 | 4 | 0 | 0 | 0.053 | 3 | 1 | 0 | 10 | 0 | 0 | 0.13 | | |
| | 50 | 6 | 1 | 300 | 7 | 0 | 0 | 0.093 | 5 | 2 | 0 | 2 | 0 | 0 | 0.027 | | |
| | 50 | 6 | 1 | 300 | 7 | 0 | 0 | 0.093 | 3 | 4 | 0 | 5 | 0 | 0 | 0.067 | | |
| | 50 | 6 | 1 | 300 | 140 | 11 | 0 | 1.9 | 61 | 79 | 0 | 14 | 0 | 0 | 0.19 | | |
| | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.033 | nd | nd | nd | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 16 | 0 | 0 | 0.21 | nd | nd | nd | 5 | 0 | 0 | 0.067 | | |
| | 50 | 6 | 1 | 300 | 13 | 0 | 1 | 0.13 | nd | nd | nd | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 8 | 0 | 0 | 0.11 | nd | nd | nd | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 10 | 0 | 1 | 0.13 | nd | nd | nd | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 6 | 0 | 0 | 0.080 | nd | nd | nd | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 12 | 0 | 0 | 0.044 | 7 | 5 | 0 | 3 | 1 | 0 | 0.011 | | |
| | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.040 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 3 | 0 | 0 | 0.040 | 0 | 3 | 0 | 3 | 0 | 0 | 0.040 | | |
| | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.013 | 0 | 1 | 0 | 1 | 0 | 0 | 0.013 | | |
| | 50 | 6 | 1 | 300 | 10 | 0 | 0 | 0.13 | 3 | 7 | 0 | 1 | 0 | 0 | 0.013 | | |
| | 50 | 6 | 1 | 300 | 12 | 0 | 0 | 0.20 | 7 | 5 | 0 | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.031 | | |
| | 50 | 6 | 1 | 300 | 20 | 3 | 0 | 0.27 | 9 | 11 | 0 | 2 | 0 | 0 | 0.027 | | |
| | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 50 | 6 | 1 | 300 | 80 | 1 | 0 | 0.13 | 36 | 44 | 0 | 13 | 0 | 0 | 0.022 | | |
| 50 | 6 | 1 | 300 | 18 | 0 | 0 | 0.13 | 9 | 9 | 0 | 10 | 0 | 0 | 0.074 | | | |
| 50 | 6 | 1 | 300 | 29 | 0 | 1 | 0.048 | 18 | 11 | 0 | 10 | 0 | 0 | 0.017 | | | |
| | | | | | | 15,600 | 753 | 15 | 3 | 0.0029 | nd | nd | nd | 259 | 1 | 0 | 0.0010 |
| Kooconusa Reservoir (Gold Creek) | RG_GC | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.060 | |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0.053 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0.053 |
| | | 50 | 6 | 1 | 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0.040 |
| | | 50 | 6 | 1 | 300 | 11 | 0 | 0 | 0.11 | 9 | 2 | 0 | 1 | 0 | 0 | 0 | 0.010 |
| | | 50 | 6 | 1 | 300 | 2 | 0 | 0 | 0.016 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 0.080 |
| | | 50 | 6 | 1 | 300 | 1 | 0 | 0 | 0.020 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0.14 |
| | | 50 | 6 | 1 | 300 | 25 | 0 | 0 | 0.33 | 12 | 13 | 0 | 1 | 0 | 0 | 0 | 0.013 |
| | | 50 | 6 | 1 | 300 | 30 | 0 | 0 | 0.23 | 21 | 9 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 5 | 0 | 0 | 0.063 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 9 | 0 | 0 | 0.11 | 7 | 2 | 0 | 1 | 0 | 0 | 0 | 0.012 |
| | | 50 | 6 | 1 | 300 | 9 | 0 | 1 | 0.11 | 5 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 13 | 0 | 0 | 0.19 | 8 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 2 | 300 | 10 | 0 | 1 | 0.11 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 3 | 300 | 19 | 0 | 0 | 0.22 | 10 | 9 | 0 | 4 | 0 | 0 | 0 | 0.047 |
| | | 50 | 6 | 1 | 300 | 7 | 0 | 0 | 0.10 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 50 | 6 | 1 | 300 | 4 | 0 | 0 | 0.062 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 6 | 1 | 300 | 54 | 0 | 0 | 0.14 | 26 | 28 | 0 | 5 | 0 | 0 | 0 | 0.013 | | |
| 50 | 6 | 1 | 300 | 59 | 0 | 9 | 0.26 | 29 | 30 | 0 | 4 | 0 | 0 | 0 | 0.018 | | |
| | | | | | | 7,500 | 258 | 0 | 11 | 0.0043 | 150 | 108 | 0 | 46 | 0 | 0 | 0.00076 |

Notes: ID = idetermined.
^a CPU^e calc

APPENDIX D
Field Data

Table D.6: Hoop Net Catch and Catch-Per-Unit-Effort, May 2019

Table with columns: Area Type, Station ID, Net ID, Net Size, UTM (NAD83, Zone 11U) (Easting, Northing), Set Date, Lift Date, Set Time, Removal Time, Fishing Hours, Depth Range (m), Set Configuration, Effort (Fishing days), Redside Shiner (Catch, Mortalities, Sacrificed, CPUE, Male, Females, Juvenile), Longnose Sucker (Catch, Mortalities, Sacrificed, CPUE), Longnose Dace (Catch, Mortalities, Sacrificed, CPUE).

Notes: ID = identifier; UTM = Universal Transverse Mercator; NAD = North American Datum; CPUE = catch-per-unit-effort; HN = hoop net; nd = not determined; "-" indicates unknown.
Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort (days) for individual hoop net configurations.

APPENDIX D
Field Data

| Area Type | Area Description | Area Code | Trap ID | UTM (NAD83, Zone 11U) | | Set Date | Lift Date | Set Time | Lift Time | # of Traps | Effort (trap days) | Redside Shiner | | | | | | | Longnose Dace | | | | Northern Pikeminnow | | | | | | | | | | |
|-----------|------------------|-----------|--------------|--------------------------|----------|-----------|-----------|----------|-----------|------------|-----------------------|----------------|-------------|------------|-------------------|-----------|-----------|-----------|---------------|-------------|------------|-------------------|---------------------|-------------|------------|-------------------|----------|----------|----------|----------|----------|----------|----|
| | | | | Easting | Northing | | | | | | | Catch | Mortalities | Sacrificed | CPUE ^a | Male | Female | Juvenile | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | | | | | | | |
| | | | GO13-MT-01 | 652969 | 5514038 | 09-May-19 | 10-May-19 | 8:10 | 8:00 | 3 | 2.98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-02 | 652916 | 5514075 | 09-May-19 | 10-May-19 | 8:10 | 8:50 | 3 | 3.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-03 | 652969 | 5514038 | 10-May-19 | 11-May-19 | 8:00 | 11:15 | 3 | 3.41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-04 | 652969 | 5514075 | 10-May-19 | 11-May-19 | 8:50 | 11:20 | 3 | 3.31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-05 | 652969 | 5514038 | 11-May-19 | 13-May-19 | 11:20 | 8:30 | 3 | 5.65 | 1 | 0 | 0 | 0.18 | nd | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-06 | 652969 | 5514075 | 11-May-19 | 13-May-19 | 11:20 | 8:50 | 3 | 5.69 | 1 | 0 | 0 | 0.18 | nd | nd | nd | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-07 | 652969 | 5514038 | 13-May-19 | 15-May-19 | 8:00 | 9:00 | 2 | 4.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un |
| | | | GO13-MT-08 | 652969 | 5514075 | 13-May-19 | 15-May-19 | 8:00 | 9:00 | 2 | 4.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un |
| | | | GO13-MT-09 | 652969 | 5514038 | 15-May-19 | 17-May-19 | 8:00 | 9:00 | 2 | 4.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un |
| | | | GO13-MT-10 | 652969 | 5514075 | 15-May-19 | 17-May-19 | 8:00 | 9:00 | 2 | 4.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un |
| | | | GO13-MT-11 | 652932 | 5514071 | 23-May-19 | 24-May-19 | 9:10 | 9:10 | 2 | 2.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-12 | 652956 | 5514046 | 23-May-19 | 24-May-19 | 9:15 | 9:00 | 2 | 1.98 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-13 | 652909 | 5514077 | 27-May-19 | 28-May-19 | 10:45 | 13:15 | 2 | 2.21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-14 | 652956 | 5514044 | 27-May-19 | 28-May-19 | 10:45 | 13:15 | 2 | 2.21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-15 | 652956 | 5514044 | 28-May-19 | 29-May-19 | 13:40 | 8:40 | 2 | 1.58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-16 | 652909 | 5514077 | 28-May-19 | 29-May-19 | 13:40 | 8:45 | 2 | 1.59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0.63 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-17 | 652956 | 5514044 | 29-May-19 | 30-May-19 | 9:00 | 8:55 | 2 | 1.99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | GO13-MT-18 | 652909 | 5514077 | 29-May-19 | 30-May-19 | 9:15 | 9:00 | 2 | 1.98 | 1 | 0 | 0 | 0.51 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | Total | | | | | | | 42 | 56 | 3 | 0 | 0 | 0.054 | nd | nd | nd | 1 | 0 | 0 | 0 | 0.018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Notes: IU = Identifier; UTM = Universal Transverse Mercator; NAD = North American Datum; CPUE = catch-per-unit-effort; MT = minnow trap; nd = not determined; un = unknown due to missing field sheets (start and end times are estimates based on previous traps).
^a Total catch-per-unit-effort (CPUE) = total # of fish / effort (trap days).
^b Lift and set times are estimates.

Table D.7: Minnow Trap Catch and C:

| Area Type | Area Description | Area Code | Peamouth Chub | | | | Eastern Brook Trout | | | | Longnose Sucker | | | | Mountain Whitefish | | | | Yellow Perch | | | | Largescale Sucker | | | | Westslope Cutthroat Trout | | | | | | |
|-----------|--|----------------------------------|---------------|------------|----------|-------|---------------------|-----------|----------|-------|-----------------|-----------|----------|-------|--------------------|-----------|----------|-------|--------------|-----------|----------|-------|-------------------|-----------|----------|-------|---------------------------|-----------|----------|-------|---|---|---|
| | | | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | Catch | Mortality | Sacrifed | CPUE* | | | |
| Reference | Loon Lake | RG_LNLK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | Grave Lake | RG_GRLK | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | Kooconusa Reservoir (Englishman Creek) | RG_ER | 1 | 0 | 0 | 0.53 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | | 4 | 0 | 0 | 1.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 3 | 0 | 0 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 3 | 0 | 0 | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 2 | 0 | 0 | 0.62 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 1 | 0 | 0 | 0.23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | 14 | 0 | 0 | 0.34 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.025 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0.074 | 2 | 0 | 0 | 0.049 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | Kooconusa Reservoir (Gold Creek) | RG_GC | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 1 | 0 | 0 | 0.25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 1 | 0 | 0 | 0.49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | 2 | 0 | 0 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 5 | 0 | 0 | 0.07 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

APPENDIX D
Field Data

Table with 28 columns: Area Type, Area Description, Area Code, and species-specific metrics (Catch, Mortalities, Sacrificed, CPUE*) for Peamouth Chub, Eastern Brook Trout, Longnose Sucker, Mountain Whitefish, Yellow Perch, Largescale Sucker, and Westslope Cutthroat Trout. Data is organized into three sub-sections for Elk River Impoundment in Fernie (RG_ERIMF), Elk River Wetland South of Fernie (RG_ERWSF), and Lower Elk River Oxbow (RG_EROL).

| Area Type | Area Description | Area Code | Peamouth Chub | | | | Eastern Brook Trout | | | | Longnose Sucker | | | | Mountain Whitefish | | | | Yellow Perch | | | | Largescale Sucker | | | | Westslope Cutthroat Trout | | | | | | | |
|-----------|------------------|-----------|---------------|-------------|------------|-------------------|---------------------|-------------|------------|-------------------|-----------------|-------------|------------|-------------------|--------------------|-------------|------------|-------------------|--------------|-------------|------------|-------------------|-------------------|-------------|------------|-------------------|---------------------------|-------------|------------|-------------------|---|---|---|---|
| | | | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | Catch | Mortalities | Sacrificed | CPUE ^a | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 2.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 6.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 7.0 | 1 | 0 | 0 | 0.18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | | | | |
| | | | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | | | | |
| | | | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | | | | |
| | | | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | un | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.51 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 9.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 4.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 201 | 0 | 1 | 3.6 | 1 | 0 | 0 | 0.018 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |

Notes: ID = identifier; UTM = Universal Transverse Mercator; NAD = North American Datum; CPUE = catch-per-unit-effort; MT = minnow trap; nd = not determined; un = unknown due to missing field sheets (start and end times are estimates based on previous days)
^a Total catch-per-unit-effort (CPUE) = total # of fish / effort (trap days).
^b Lift and set times are estimates.



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 08-MAY-19
Report Date: 16-MAY-19 09:34 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2269908
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-10
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

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ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2269908-1 | L2269908-2 | | |
|-----------------------------|---|---------------------------------|--------------------------------|---|--|--|
| | | Description | WS | WS | | |
| | | Sampled Date | 06-MAY-19 | 06-MAY-19 | | |
| | | Sampled Time | 14:52 | 14:52 | | |
| | | Client ID | RG_ELWDGC_WS _20190506-1452 | RG_ELWDGC_WS _20190506-1452 FB-HG | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 531 | | | | |
| | Hardness (as CaCO3) (mg/L) | 270 | | | | |
| | pH (pH) | 8.38 | | | | |
| | ORP (mV) | 398 | | | | |
| | Total Suspended Solids (mg/L) | 2.0 | | | | |
| | Total Dissolved Solids (mg/L) | 323 | DLHC | | | |
| | Turbidity (NTU) | 1.53 | | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | <1.0 | | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 185 | | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | 4.4 | | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | 190 | | | | |
| | Ammonia as N (mg/L) | 0.0351 | | | | |
| | Bromide (Br) (mg/L) | <0.050 | | | | |
| | Chloride (Cl) (mg/L) | 4.15 | | | | |
| | Fluoride (F) (mg/L) | 0.209 | | | | |
| | Ion Balance (%) | 97.0 | | | | |
| | Nitrate (as N) (mg/L) | 1.11 | | | | |
| | Nitrite (as N) (mg/L) | 0.0058 | | | | |
| | Total Kjeldahl Nitrogen (mg/L) | 0.294 | | | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0056 | | | | |
| | Sulfate (SO4) (mg/L) | 83.8 | | | | |
| | Anion Sum (meq/L) | 5.74 | | | | |
| | Cation Sum (meq/L) | 5.57 | | | | |
| | Cation - Anion Balance (%) | -1.5 | | | | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 1.07 | | | |
| Total Organic Carbon (mg/L) | | 1.39 | | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0075 | | | | |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | | | | |
| | Arsenic (As)-Total (mg/L) | 0.00020 | | | | |
| | Barium (Ba)-Total (mg/L) | 0.0785 | | | | |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | | | |
| | Boron (B)-Total (mg/L) | 0.014 | | | | |
| | Cadmium (Cd)-Total (ug/L) | 0.0089 | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2269908-1 | L2269908-2 | | |
|-------------------------|---------------------------------------|--------------|--------------------------------|---|--|--|
| | | Description | WS | WS | | |
| | | Sampled Date | 06-MAY-19 | 06-MAY-19 | | |
| | | Sampled Time | 14:52 | 14:52 | | |
| | | Client ID | RG_ELWDGC_WS _20190506-1452 | RG_ELWDGC_WS _20190506-1452 FB-HG | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | 73.5 | | | | |
| | Chromium (Cr)-Total (mg/L) | 0.00014 | | | | |
| | Cobalt (Co)-Total (ug/L) | 0.12 | | | | |
| | Copper (Cu)-Total (mg/L) | <0.00050 | | | | |
| | Iron (Fe)-Total (mg/L) | 0.196 | | | | |
| | Lead (Pb)-Total (mg/L) | <0.000050 | | | | |
| | Lithium (Li)-Total (mg/L) | 0.0107 | | | | |
| | Magnesium (Mg)-Total (mg/L) | 21.4 | | | | |
| | Manganese (Mn)-Total (mg/L) | 0.0397 | | | | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.00127 | | | | |
| | Nickel (Ni)-Total (mg/L) | 0.00066 | | | | |
| | Potassium (K)-Total (mg/L) | 0.740 | | | | |
| | Selenium (Se)-Total (ug/L) | 8.27 | | | | |
| | Silicon (Si)-Total (mg/L) | 2.28 | | | | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | | | | |
| | Sodium (Na)-Total (mg/L) | 3.68 | | | | |
| | Strontium (Sr)-Total (mg/L) | 0.331 | | | | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | | | | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | | | | |
| | Uranium (U)-Total (mg/L) | 0.000979 | | | | |
| | Vanadium (V)-Total (mg/L) | <0.00050 | | | | |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | | | | |
| | Dissolved Metals Filtration Location | LAB | | | | |
| | Aluminum (Al)-Dissolved (mg/L) | <0.0030 | | | | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00016 | | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.0757 | | | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.020 | | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | | | | |
| | Boron (B)-Dissolved (mg/L) | 0.014 | | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | 0.0052 | | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 73.9 | | | | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2269908-1 WS 06-MAY-19 14:52 RG_ELWDGC_WS _20190506-1452 | L2269908-2 WS 06-MAY-19 14:52 RG_ELWDGC_WS _20190506-1452 FB-HG | | |
|-------------------------|--|--|---|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | 0.015 | | | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | 0.0107 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 20.8 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00745 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00130 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00052 | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.738 | | | |
| | Selenium (Se)-Dissolved (ug/L) | 10.0 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 2.21 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | 3.49 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.331 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.000946 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2269908-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2269908-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2269908-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2269908-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2269908-1 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2269908-1 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2269908-1 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2269908-1 |
| Matrix Spike | Selenium (Se)-Total | MS-B | L2269908-1 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2269908-1 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved. | | | |
| C-TOT-ORG-LOW-CL | Water | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |

Reference Information

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

Reference Information

| | | | |
|---|-------|---------------------------------|--------------------------|
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-10

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4635463 | | | | | | | |
| WG3050093-3 | DUP | L2269908-1 | | | | | | |
| Acidity (as CaCO3) | | <1.0 | <1.0 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050093-2 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 106.0 | | % | | 85-115 | 14-MAY-19 |
| WG3050093-1 | MB | | | | | | | |
| Acidity (as CaCO3) | | | <1.0 | | mg/L | | 2 | 14-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634423 | | | | | | | |
| WG3049092-11 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 96.0 | | % | | 85-115 | 13-MAY-19 |
| WG3049092-10 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 13-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633493 | | | | | | | |
| WG3047666-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 84.0 | | % | | 80-120 | 13-MAY-19 |
| WG3047666-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 13-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633555 | | | | | | | |
| WG3047590-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 89.2 | | % | | 80-120 | 13-MAY-19 |
| WG3047590-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 13-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Bromide (Br) | | | 103.1 | | % | | 85-115 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 09-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4635817 | | | | | | | |
| WG3050807-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 106.7 | | % | | 80-120 | 15-MAY-19 |
| WG3050807-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 15-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|--------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| C-TOT-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4635232 | | | | | | | |
| WG3050176-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 114.9 | | % | | 80-120 | 14-MAY-19 |
| WG3050176-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 14-MAY-19 |
| CL-IC-N-CL | Water | | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Chloride (Cl) | | | 100.3 | | % | | 90-110 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 09-MAY-19 |
| EC-L-PCT-CL | Water | | | | | | | |
| Batch | R4634423 | | | | | | | |
| WG3049092-11 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 103.3 | | % | | 90-110 | 13-MAY-19 |
| WG3049092-10 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 13-MAY-19 |
| F-IC-N-CL | Water | | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Fluoride (F) | | | 102.9 | | % | | 90-110 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 09-MAY-19 |
| HG-D-CVAA-VA | Water | | | | | | | |
| Batch | R4632265 | | | | | | | |
| WG3048419-2 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 95.0 | | % | | 80-120 | 13-MAY-19 |
| WG3048419-1 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 13-MAY-19 |
| WG3048419-4 | MS | L2269908-1 | | | | | | |
| Mercury (Hg)-Dissolved | | | 85.6 | | % | | 70-130 | 13-MAY-19 |
| HG-T-U-CVAF-VA | Water | | | | | | | |
| Batch | R4634650 | | | | | | | |
| WG3049335-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 93.6 | | % | | 80-120 | 14-MAY-19 |
| WG3049335-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 14-MAY-19 |
| MET-D-CCMS-VA | Water | | | | | | | |



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633493 | | | | | | | |
| WG3047666-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 100.4 | | % | | 80-120 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | | 91.3 | | % | | 80-120 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | | 96.2 | | % | | 80-120 | 13-MAY-19 |
| Barium (Ba)-Dissolved | | | 94.9 | | % | | 80-120 | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 91.2 | | % | | 80-120 | 13-MAY-19 |
| Boron (B)-Dissolved | | | 84.4 | | % | | 80-120 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 99.0 | | % | | 80-120 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | | 86.7 | | % | | 80-120 | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | | 98.1 | | % | | 80-120 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | | 96.8 | | % | | 80-120 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | | 96.9 | | % | | 80-120 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | | 92.3 | | % | | 80-120 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | | 91.2 | | % | | 80-120 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | | 82.6 | | % | | 80-120 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 105.1 | | % | | 80-120 | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | | 98.6 | | % | | 80-120 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 89.5 | | % | | 80-120 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | | 97.5 | | % | | 80-120 | 13-MAY-19 |
| Potassium (K)-Dissolved | | | 98.0 | | % | | 80-120 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | | 97.2 | | % | | 80-120 | 13-MAY-19 |
| Silicon (Si)-Dissolved | | | 97.2 | | % | | 60-140 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | | 86.1 | | % | | 80-120 | 13-MAY-19 |
| Sodium (Na)-Dissolved | | | 99.6 | | % | | 80-120 | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | | 89.4 | | % | | 80-120 | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | | 90.2 | | % | | 80-120 | 13-MAY-19 |
| Tin (Sn)-Dissolved | | | 88.1 | | % | | 80-120 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | | 92.9 | | % | | 80-120 | 13-MAY-19 |
| Uranium (U)-Dissolved | | | 92.9 | | % | | 80-120 | 13-MAY-19 |
| Vanadium (V)-Dissolved | | | 98.5 | | % | | 80-120 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | | 97.4 | | % | | 80-120 | 13-MAY-19 |
| WG3047666-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |



Quality Control Report

Workorder: L2269908

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633493 | | | | | | | |
| WG3047666-1 | MB | LF | | | | | | |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 13-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633555 | | | | | | | |
| WG3047590-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 95.9 | | % | | 80-120 | 13-MAY-19 |
| Antimony (Sb)-Total | | | 98.2 | | % | | 80-120 | 13-MAY-19 |
| Arsenic (As)-Total | | | 94.7 | | % | | 80-120 | 13-MAY-19 |
| Barium (Ba)-Total | | | 94.2 | | % | | 80-120 | 13-MAY-19 |



Quality Control Report

Workorder: L2269908

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4633555 | | | | | | | |
| WG3047590-2 | LCS | | | | | | | |
| Bismuth (Bi)-Total | | | 95.0 | | % | | 80-120 | 13-MAY-19 |
| Boron (B)-Total | | | 90.4 | | % | | 80-120 | 13-MAY-19 |
| Cadmium (Cd)-Total | | | 97.5 | | % | | 80-120 | 13-MAY-19 |
| Calcium (Ca)-Total | | | 91.6 | | % | | 80-120 | 13-MAY-19 |
| Chromium (Cr)-Total | | | 97.8 | | % | | 80-120 | 13-MAY-19 |
| Cobalt (Co)-Total | | | 93.9 | | % | | 80-120 | 13-MAY-19 |
| Copper (Cu)-Total | | | 94.5 | | % | | 80-120 | 13-MAY-19 |
| Iron (Fe)-Total | | | 95.0 | | % | | 80-120 | 13-MAY-19 |
| Lead (Pb)-Total | | | 97.1 | | % | | 80-120 | 13-MAY-19 |
| Lithium (Li)-Total | | | 89.3 | | % | | 80-120 | 13-MAY-19 |
| Magnesium (Mg)-Total | | | 96.8 | | % | | 80-120 | 13-MAY-19 |
| Manganese (Mn)-Total | | | 97.3 | | % | | 80-120 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | | 95.1 | | % | | 80-120 | 13-MAY-19 |
| Nickel (Ni)-Total | | | 91.8 | | % | | 80-120 | 13-MAY-19 |
| Potassium (K)-Total | | | 95.2 | | % | | 80-120 | 13-MAY-19 |
| Selenium (Se)-Total | | | 94.5 | | % | | 80-120 | 13-MAY-19 |
| Silicon (Si)-Total | | | 96.7 | | % | | 80-120 | 13-MAY-19 |
| Silver (Ag)-Total | | | 96.9 | | % | | 80-120 | 13-MAY-19 |
| Sodium (Na)-Total | | | 100.6 | | % | | 80-120 | 13-MAY-19 |
| Strontium (Sr)-Total | | | 96.4 | | % | | 80-120 | 13-MAY-19 |
| Thallium (Tl)-Total | | | 93.9 | | % | | 80-120 | 13-MAY-19 |
| Tin (Sn)-Total | | | 96.8 | | % | | 80-120 | 13-MAY-19 |
| Titanium (Ti)-Total | | | 96.1 | | % | | 80-120 | 13-MAY-19 |
| Uranium (U)-Total | | | 98.5 | | % | | 80-120 | 13-MAY-19 |
| Vanadium (V)-Total | | | 98.4 | | % | | 80-120 | 13-MAY-19 |
| Zinc (Zn)-Total | | | 95.4 | | % | | 80-120 | 13-MAY-19 |
| WG3047590-1 | | MB | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 13-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Cadmium (Cd)-Total | | | <0.000005C | | mg/L | | 0.000005 | 13-MAY-19 |



Quality Control Report

Workorder: L2269908

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4633555 | | | | | | | |
| WG3047590-1 | MB | | | | | | | |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 13-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 13-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 13-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 13-MAY-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4635246 | | | | | | | |
| WG3050192-6 | LCS | | | | | | | |
| Ammonia as N | | | 99.1 | | % | | 85-115 | 14-MAY-19 |
| WG3050192-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Nitrite (as N) | | | 103.3 | | % | | 90-110 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 09-MAY-19 |



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------------|-------------------|---------|-----------|-------|-----|---------|-----------|
| NO3-L-IC-N-CL | Water | | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.6 | | % | | 90-110 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 09-MAY-19 |
| ORP-CL | Water | | | | | | | |
| Batch | R4634296 | | | | | | | |
| WG3048846-15 | CRM | CL-ORP | | | | | | |
| ORP | | | 223 | | mV | | 210-230 | 13-MAY-19 |
| P-T-L-COL-CL | Water | | | | | | | |
| Batch | R4634884 | | | | | | | |
| WG3049594-14 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 105.5 | | % | | 80-120 | 14-MAY-19 |
| WG3049594-13 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 14-MAY-19 |
| PH-CL | Water | | | | | | | |
| Batch | R4634423 | | | | | | | |
| WG3049092-11 | LCS | | | | | | | |
| pH | | | 6.98 | | pH | | 6.9-7.1 | 13-MAY-19 |
| PO4-DO-L-COL-CL | Water | | | | | | | |
| Batch | R4629111 | | | | | | | |
| WG3044829-38 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 101.6 | | % | | 80-120 | 08-MAY-19 |
| WG3044829-37 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 08-MAY-19 |
| SO4-IC-N-CL | Water | | | | | | | |
| Batch | R4630449 | | | | | | | |
| WG3046497-6 | LCS | | | | | | | |
| Sulfate (SO4) | | | 101.1 | | % | | 90-110 | 09-MAY-19 |
| WG3046497-5 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 09-MAY-19 |
| SOLIDS-TDS-CL | Water | | | | | | | |
| Batch | R4630819 | | | | | | | |
| WG3045301-18 | DUP | L2269908-1 | | | | | | |
| Total Dissolved Solids | | 323 | 322 | | mg/L | 0.3 | 20 | 09-MAY-19 |
| WG3045301-17 | LCS | | | | | | | |



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|----------|--------------|--------|-----------|-------|-----|--------|-----------|
| SOLIDS-TDS-CL | | Water | | | | | | |
| Batch | R4630819 | | | | | | | |
| WG3045301-17 LCS | | | | | | | | |
| Total Dissolved Solids | | | 96.1 | | % | | 85-115 | 09-MAY-19 |
| WG3045301-16 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 09-MAY-19 |
| TKN-L-F-CL | | Water | | | | | | |
| Batch | R4635304 | | | | | | | |
| WG3050063-10 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.1 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-13 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 97.7 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-16 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 97.2 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-2 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.6 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-20 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.8 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-6 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.7 | | % | | 75-125 | 13-MAY-19 |
| WG3050063-1 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| WG3050063-12 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| WG3050063-15 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| WG3050063-19 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| WG3050063-5 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| WG3050063-9 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| TSS-L-CL | | Water | | | | | | |
| Batch | R4631259 | | | | | | | |
| WG3046330-2 LCS | | | | | | | | |
| Total Suspended Solids | | | 89.4 | | % | | 85-115 | 10-MAY-19 |
| WG3046330-1 MB | | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 10-MAY-19 |
| TURBIDITY-CL | | Water | | | | | | |



Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------|-----------------|-----------|--------|-----------|-------|-----|--------|-----------|
| TURBIDITY-CL | Water | | | | | | | |
| Batch | R4630303 | | | | | | | |
| WG3046239-17 | LCS | | | | | | | |
| Turbidity | | | 95.5 | | % | | 85-115 | 09-MAY-19 |
| WG3046239-16 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 09-MAY-19 |

Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2269908

Report Date: 16-MAY-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|---|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation reduction potential by elect. | 1 | 06-MAY-19 14:52 | 13-MAY-19 13:00 | 0.25 | 166 | hours | EHTR-FM |
| pH | 1 | 06-MAY-19 14:52 | 13-MAY-19 09:00 | 0.25 | 162 | hours | EHTR-FM |

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2269908 were received on 08-MAY-19 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

COC ID: **REP-Lentic 19-10**

TURNAROUND TIME:

| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
|----------------------|--------------------------------|----------|--------|--------------|-------------------------------|----------|--------|
| Facility Name / Job# | Regional Effects Program (REP) | | | Lab Name | ALS Calgary | | |
| Project Manager | Cait Good | | | Lab Contact | Lyudmyla Shvets | | |
| Email | cait.good@teck.com | | | Email | lyudmyla.shvets@alsglobal.com | | |
| Address | 421 Pine Avenue | | | Address | 2559 29 Street NE | | |
| City | Sparwood | Province | BC | City | Calgary | Province | AB |
| Postal Code | V0B 2G0 | Country | Canada | Postal Code | T1Y 7B5 | Country | Canada |
| Phone Number | 250-425-8202 | | | Phone Number | 1 403 407 1794 | | |

| SAMPLE DETAILS | | | | | | | | ANALYSIS REQUESTED | | | | | | | | | |
|----------------------------------|-----------------|--------------|-----------------------------|----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|-------|-----|-----|
| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | Excel | PDF | EDD |
| RG_ELWDGC_WS_20190506-1452 | RG_ELWDGC | WS | No | 6-May-19 | 1452 | G | 7 | X | X | X | X | X | X | X | | | |
| RG_ELWDGC_WS_20190506-1452 FB-HG | RG_ELWDGC | WS | No | 6-May-19 | 1452 | G | 1 | | | | X | | | | | | |
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| | | | |
|--|-----------------------------|-----------|--------------------------------|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | RELINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
| | | | <i>[Signature]</i> 5/8 9:00 am |

| | | | | | | |
|------------------------------------|---|--|---|---|---------------------|-----------|
| NB OF BOTTLES RETURNED/DESCRIPTION | Regular (default) <input checked="" type="checkbox"/> | Priority (2-3 business days) - 50% surcharge | Emergency (1 Business Day) - 100% surcharge | For Emergency <1 Day, ASAP or Weekend - Contact ALS | Sampler's Name | Mobile # |
| | | | | | Sampler's Signature | Date/Time |



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 09-MAY-19
Report Date: 17-MAY-19 10:50 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2270399
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-12
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-1 | L2270399-2 | L2270399-3 | L2270399-4 | L2270399-5 |
|-----------------------------|---|---------------------------------|------------------------------|--|------------------------------|--|-----------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 09:25 | 09:25 | 13:00 | 13:00 | 13:00 |
| | | Client ID | RG_GO13_WS_20 190507-0925 | RG_GO13_WS_20 190507-0925 FB- HG | RG_GRLK_WS_20 190507-1300 | RG_GRLK_WS_20 190507-1300 FB- HG | RG_DUP_WS_201 90507-1300 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 1050 | | 315 | | 314 |
| | Hardness (as CaCO3) (mg/L) | | 603 | | 162 | | 176 |
| | pH (pH) | | 8.31 | | 8.39 | | 8.39 |
| | ORP (mV) | | 391 | | 452 | | 446 |
| | Total Suspended Solids (mg/L) | | 3.4 | | 15.0 | | 9.3 |
| | Total Dissolved Solids (mg/L) | | 754 ^{DLHC} | | 178 ^{DLHC} | | 176 ^{DLHC} |
| | Turbidity (NTU) | | 5.30 | | 2.46 | | 2.78 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 234 | | 146 | | 143 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | 2.4 | | 3.4 | | 3.4 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 236 | | 149 | | 146 |
| | Ammonia as N (mg/L) | | 0.0426 ^{DLHC} | | 0.0068 | | <0.0050 |
| | Bromide (Br) (mg/L) | | <0.25 ^{DLHC} | | <0.050 | | <0.050 |
| | Chloride (Cl) (mg/L) | | 24.1 ^{DLHC} | | 0.55 | | 0.51 |
| | Fluoride (F) (mg/L) | | 0.19 ^{DLHC} | | 0.598 | | 0.565 |
| | Ion Balance (%) | | 98.1 ^{DLHC} | | 96.6 | | 106 |
| | Nitrate (as N) (mg/L) | | 1.03 ^{DLHC} | | <0.0050 | | <0.0050 |
| | Nitrite (as N) (mg/L) | | <0.0050 ^{DLHC} | | <0.0010 | | <0.0010 |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.250 | | 0.242 | | 0.234 |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | <0.0010 | | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | | 0.0068 ^{DLHC} | | 0.017 ^{DLM} | | 0.0193 ^{RRV} |
| | Sulfate (SO4) (mg/L) | | 347 | | 20.9 | | 20.9 |
| | Anion Sum (meq/L) | | 12.7 | | 3.46 | | 3.40 |
| | Cation Sum (meq/L) | | 12.5 | | 3.34 | | 3.61 |
| | Cation - Anion Balance (%) | | -1.0 | | -1.7 | | 3.0 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 2.44 | | 3.04 | |
| Total Organic Carbon (mg/L) | | | 2.51 | | 4.00 | | 5.37 |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0573 | | 0.0337 | | 0.0265 |
| | Antimony (Sb)-Total (mg/L) | | 0.00036 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Total (mg/L) | | 0.00018 | | 0.00043 | | 0.00039 |
| | Barium (Ba)-Total (mg/L) | | 0.0964 | | 0.0559 | | 0.0561 |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Total (mg/L) | | 0.022 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | | 0.0110 | | 0.0081 | | 0.0057 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-6 | L2270399-7 | L2270399-8 | L2270399-9 | L2270399-10 |
|-----------------------------|---|---------------------------------|-----------------------------------|------------------------------|-----------------------------|------------------------------|------------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 13:00 | 12:00 | 13:00 | 13:45 | 13:45 |
| | | Client ID | RG_DUP_WS_201 90507-1300 FB-HG | RG_TRIP_WS_201 90507-0000 | RG_FBLANK_2019 0507-1300 | RG_EROL_WS_20 190507-1345 | RG_EROL_WS_20 190507-1345 FB-HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | | <2.0 | <2.0 | 424 | |
| | Hardness (as CaCO3) (mg/L) | | | <0.50 | <0.50 | 223 | |
| | pH (pH) | | | 5.68 | 5.13 | 8.34 | |
| | ORP (mV) | | | 429 | 465 | 476 | |
| | Total Suspended Solids (mg/L) | | | <1.0 | <1.0 | <1.0 | |
| | Total Dissolved Solids (mg/L) | | | <10 | <10 | 245 | DLHC |
| | Turbidity (NTU) | | | <0.10 | <0.10 | 0.54 | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | | 2.4 | 1.9 | <1.0 | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | | <1.0 | <1.0 | 194 | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | | <1.0 | <1.0 | 3.2 | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | | <1.0 | <1.0 | <1.0 | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | | <1.0 | <1.0 | 198 | |
| | Ammonia as N (mg/L) | | | <0.0050 | <0.0050 | <0.0050 | |
| | Bromide (Br) (mg/L) | | | <0.050 | <0.050 | <0.050 | |
| | Chloride (Cl) (mg/L) | | | <0.50 | <0.50 | 4.48 | |
| | Fluoride (F) (mg/L) | | | <0.020 | <0.020 | 0.131 | |
| | Ion Balance (%) | | | 0.0 | 0.0 | 99.0 | |
| | Nitrate (as N) (mg/L) | | | <0.0050 | <0.0050 | 0.269 | |
| | Nitrite (as N) (mg/L) | | | <0.0010 | <0.0010 | 0.0010 | |
| | Total Kjeldahl Nitrogen (mg/L) | | | <0.050 | <0.050 | 0.127 | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | | <0.0010 | <0.0010 | 0.0010 | |
| | Phosphorus (P)-Total (mg/L) | | | <0.0020 | <0.0020 | 0.0021 | |
| | Sulfate (SO4) (mg/L) | | | <0.30 | <0.30 | 27.2 | |
| | Anion Sum (meq/L) | | | <0.10 | <0.10 | 4.67 | |
| | Cation Sum (meq/L) | | | <0.10 | <0.10 | 4.62 | |
| | Cation - Anion Balance (%) | | | 0.0 | 0.0 | -0.5 | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | | | <0.50 | 1.57 |
| Total Organic Carbon (mg/L) | | | | <0.50 | <0.50 | 1.66 | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | | <0.0030 | <0.0030 | 0.0036 | |
| | Antimony (Sb)-Total (mg/L) | | | <0.00010 | <0.00010 | <0.00010 | |
| | Arsenic (As)-Total (mg/L) | | | <0.00010 | <0.00010 | 0.00016 | |
| | Barium (Ba)-Total (mg/L) | | | <0.00010 | <0.00010 | 0.116 | |
| | Beryllium (Be)-Total (ug/L) | | | <0.020 | <0.020 | <0.020 | |
| | Bismuth (Bi)-Total (mg/L) | | | <0.000050 | <0.000050 | <0.000050 | |
| | Boron (B)-Total (mg/L) | | | <0.010 | <0.010 | <0.010 | |
| | Cadmium (Cd)-Total (ug/L) | | | <0.0050 | <0.0050 | 0.0086 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-11 | L2270399-12 | L2270399-13 | L2270399-14 | L2270399-15 |
|-----------------------------|---|---------------------------------|------------------------------|--|----------------------------|----------------------------------|-----------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 14:36 | 14:36 | 11:55 | 11:55 | 11:55 |
| | | Client ID | RG_STPD_WS_20 190507-1436 | RG_STPD_WS_20 190507-1436 FB- HG | RG_ER_WS_2019 0507-1155 | RG_ER_WS_2019 0507-1155 FB-HG | RG_DUP_WS_201 90507-1155 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 414 | | 293 | | 293 |
| | Hardness (as CaCO3) (mg/L) | | 210 | | 138 | | 139 |
| | pH (pH) | | 8.35 | | 8.28 | | 8.21 |
| | ORP (mV) | | 453 | | 474 | | 439 |
| | Total Suspended Solids (mg/L) | | 1.8 | | 11.1 | | 17.0 |
| | Total Dissolved Solids (mg/L) | | 243 ^{DLHC} | | 175 ^{DLHC} | | 175 ^{DLHC} |
| | Turbidity (NTU) | | 3.43 | | 11.2 | | 10.3 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | 4.3 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 149 | | 109 | | 111 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | 2.6 | | <1.0 | | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 152 | | 109 | | 111 |
| | Ammonia as N (mg/L) | | 0.0178 | | <0.0050 | | 0.0083 |
| | Bromide (Br) (mg/L) | | <0.050 | | <0.050 | | <0.050 |
| | Chloride (Cl) (mg/L) | | 7.44 | | 4.15 | | 4.15 |
| | Fluoride (F) (mg/L) | | 0.131 | | 0.087 | | 0.096 |
| | Ion Balance (%) | | 101 | | 99.3 | | 98.9 |
| | Nitrate (as N) (mg/L) | | 0.303 | | 0.184 | | 0.181 |
| | Nitrite (as N) (mg/L) | | 0.0055 | | <0.0010 | | 0.0013 |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.206 | | 0.113 | | 0.147 |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | <0.0010 | | 0.0015 |
| | Phosphorus (P)-Total (mg/L) | | 0.0116 | | 0.0163 | | 0.0177 |
| | Sulfate (SO4) (mg/L) | | 53.6 | | 33.1 | | 33.0 |
| | Anion Sum (meq/L) | | 4.39 | | 3.00 | | 3.05 |
| | Cation Sum (meq/L) | | 4.44 | | 2.98 | | 3.01 |
| | Cation - Anion Balance (%) | | 0.5 | | -0.4 | | -0.5 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 2.32 | | 2.05 | |
| Total Organic Carbon (mg/L) | | | 2.56 | | 2.65 | | 2.54 |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0258 | | 0.192 | | 0.143 |
| | Antimony (Sb)-Total (mg/L) | | 0.00013 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Total (mg/L) | | 0.00022 | | 0.00050 | | 0.00048 |
| | Barium (Ba)-Total (mg/L) | | 0.103 | | 0.0433 | | 0.0441 |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | | 0.0084 | | 0.0141 | | 0.0110 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-16 | L2270399-17 | L2270399-18 | | |
|-----------------------------|---|---------------------------------|-----------------------------------|-------------------------------|-------------------------------------|--|--|
| | | Description | WS | WS | WS | | |
| | | Sampled Date | 07-MAY-19 | 08-MAY-19 | 08-MAY-19 | | |
| | | Sampled Time | 11:55 | 08:02 | 08:02 | | |
| | | Client ID | RG_DUP_WS_201 90507-1155 FB-HG | RG_ERIMF_WS_2 0190509-0802 | RG_ERIMF_WS_2 0190509-0802 FB-HG | | |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | | 412 | | | |
| | Hardness (as CaCO3) (mg/L) | | | 198 | | | |
| | pH (pH) | | | 8.32 | | | |
| | ORP (mV) | | | 449 | | | |
| | Total Suspended Solids (mg/L) | | | 6.6 | | | |
| | Total Dissolved Solids (mg/L) | | | 228 | DLHC | | |
| | Turbidity (NTU) | | | 5.90 | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | | <1.0 | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | | 183 | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | | 2.0 | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | | <1.0 | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | | 185 | | | |
| | Ammonia as N (mg/L) | | | <0.0050 | | | |
| | Bromide (Br) (mg/L) | | | <0.050 | | | |
| | Chloride (Cl) (mg/L) | | | 13.6 | | | |
| | Fluoride (F) (mg/L) | | | 0.081 | | | |
| | Ion Balance (%) | | | 104 | | | |
| | Nitrate (as N) (mg/L) | | | <0.0050 | | | |
| | Nitrite (as N) (mg/L) | | | <0.0010 | | | |
| | Total Kjeldahl Nitrogen (mg/L) | | | 0.234 | | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | | | 0.0214 | | | |
| | Sulfate (SO4) (mg/L) | | | 7.02 | | | |
| | Anion Sum (meq/L) | | | 4.23 | | | |
| | Cation Sum (meq/L) | | | 4.39 | | | |
| | Cation - Anion Balance (%) | | | 1.9 | | | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | | 3.45 | | |
| Total Organic Carbon (mg/L) | | | | 3.10 | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | | 0.0689 | | | |
| | Antimony (Sb)-Total (mg/L) | | | 0.00018 | | | |
| | Arsenic (As)-Total (mg/L) | | | 0.00042 | | | |
| | Barium (Ba)-Total (mg/L) | | | 0.164 | | | |
| | Beryllium (Be)-Total (ug/L) | | | <0.020 | | | |
| | Bismuth (Bi)-Total (mg/L) | | | <0.000050 | | | |
| | Boron (B)-Total (mg/L) | | | <0.010 | | | |
| | Cadmium (Cd)-Total (ug/L) | | | 0.0122 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-1 | L2270399-2 | L2270399-3 | L2270399-4 | L2270399-5 |
|-------------------------|---------------------------------------|--------------|------------------------------|--|------------------------------|--|-----------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 09:25 | 09:25 | 13:00 | 13:00 | 13:00 |
| | | Client ID | RG_GO13_WS_20 190507-0925 | RG_GO13_WS_20 190507-0925 FB- HG | RG_GRLK_WS_20 190507-1300 | RG_GRLK_WS_20 190507-1300 FB- HG | RG_DUP_WS_201 90507-1300 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 126 | | 37.9 | | 37.8 |
| | Chromium (Cr)-Total (mg/L) | | 0.00013 | | 0.00012 | | <0.00010 |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | | <0.10 | | <0.10 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Total (mg/L) | | 0.080 | | 0.053 | | 0.043 |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | | 0.000088 | | 0.000070 |
| | Lithium (Li)-Total (mg/L) | | 0.0283 | | 0.0030 | | 0.0029 |
| | Magnesium (Mg)-Total (mg/L) | | 72.6 | | 19.1 | | 18.9 |
| | Manganese (Mn)-Total (mg/L) | | 0.0149 | | 0.00475 | | 0.00420 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.00215 | | 0.00124 | | 0.00126 |
| | Nickel (Ni)-Total (mg/L) | | 0.00100 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Total (mg/L) | | 1.70 | | 0.954 | | 0.947 |
| | Selenium (Se)-Total (ug/L) | | 73.7 | | 0.263 | | 0.328 |
| | Silicon (Si)-Total (mg/L) | | 2.61 | | 2.50 | | 2.48 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 8.81 | | 1.82 | | 1.77 |
| | Strontium (Sr)-Total (mg/L) | | 0.399 | | 0.132 | | 0.131 |
| | Thallium (Tl)-Total (mg/L) | | 0.000013 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.00309 | | 0.000783 | | 0.000800 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | 0.0030 | | <0.0030 | | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | | LAB |
| | Dissolved Metals Filtration Location | | LAB | | LAB | | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | 0.0055 | | <0.0030 | | <0.0030 |
| | Antimony (Sb)-Dissolved (mg/L) | | 0.00036 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00017 | | 0.00042 | | 0.00045 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0999 | | 0.0569 | | 0.0586 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | 0.023 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | 0.0067 | | <0.0050 | | <0.0050 |
| | Calcium (Ca)-Dissolved (mg/L) | | 129 | | 35.6 | | 38.4 |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2270399-6 WS 07-MAY-19 13:00 RG_DUP_WS_201 90507-1300 FB-HG | L2270399-7 WS 07-MAY-19 12:00 RG_TRIP_WS_201 90507-0000 | L2270399-8 WS 07-MAY-19 13:00 RG_FBLANK_2019 0507-1300 | L2270399-9 WS 07-MAY-19 13:45 RG_EROL_WS_20 190507-1345 | L2270399-10 WS 07-MAY-19 13:45 RG_EROL_WS_20 190507-1345 FB- HG |
|-------------------------|---|---|--|---|--|---|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | <0.050 | <0.050 | 64.5 | |
| | Chromium (Cr)-Total (mg/L) | | <0.00010 | <0.00010 | 0.00017 | |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | <0.10 | <0.10 | |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | |
| | Iron (Fe)-Total (mg/L) | | <0.010 | <0.010 | 0.017 | |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | <0.000050 | <0.000050 | |
| | Lithium (Li)-Total (mg/L) | | <0.0010 | <0.0010 | 0.0049 | |
| | Magnesium (Mg)-Total (mg/L) | | <0.10 | <0.10 | 16.0 | |
| | Manganese (Mn)-Total (mg/L) | | <0.00010 | <0.00010 | 0.00389 | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | <0.000050 | <0.000050 | 0.000758 | |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | |
| | Potassium (K)-Total (mg/L) | | <0.050 | <0.050 | 0.549 | |
| | Selenium (Se)-Total (ug/L) | | <0.050 | <0.050 | 2.75 | |
| | Silicon (Si)-Total (mg/L) | | <0.10 | <0.10 | 2.11 | |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | <0.000010 | <0.000010 | |
| | Sodium (Na)-Total (mg/L) | | 0.086 ^{RRV} | <0.050 | 3.70 | |
| | Strontium (Sr)-Total (mg/L) | | <0.00020 | <0.00020 | 0.179 | |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | <0.000010 | <0.000010 | |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | <0.010 | <0.010 | |
| | Uranium (U)-Total (mg/L) | | <0.000010 | <0.000010 | 0.000669 | |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | <0.0030 | <0.0030 | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | LAB | LAB | |
| | Dissolved Metals Filtration Location | | LAB | LAB | LAB | |
| | Aluminum (Al)-Dissolved (mg/L) | | | <0.0030 | <0.0030 | |
| | Antimony (Sb)-Dissolved (mg/L) | | | <0.00010 | <0.00010 | |
| | Arsenic (As)-Dissolved (mg/L) | | | <0.00010 | 0.00016 | |
| | Barium (Ba)-Dissolved (mg/L) | | | <0.00010 | 0.118 | |
| | Beryllium (Be)-Dissolved (ug/L) | | | <0.020 | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | <0.000050 | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | | | <0.010 | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | <0.0050 | 0.0078 | |
| | Calcium (Ca)-Dissolved (mg/L) | | <0.050 | <0.050 | 64.2 | |
| | Chromium (Cr)-Dissolved (mg/L) | | | <0.00010 | 0.00013 | |
| | Cobalt (Co)-Dissolved (ug/L) | | | <0.10 | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-11 | L2270399-12 | L2270399-13 | L2270399-14 | L2270399-15 |
|-------------------------|---------------------------------------|--------------|------------------------------|--|----------------------------|----------------------------------|-----------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 14:36 | 14:36 | 11:55 | 11:55 | 11:55 |
| | | Client ID | RG_STPD_WS_20 190507-1436 | RG_STPD_WS_20 190507-1436 FB- HG | RG_ER_WS_2019 0507-1155 | RG_ER_WS_2019 0507-1155 FB-HG | RG_DUP_WS_201 90507-1155 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 54.0 | | 38.6 | | 38.3 |
| | Chromium (Cr)-Total (mg/L) | | 0.00025 | | 0.00036 | | 0.00029 |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | | 0.18 | | 0.15 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | | 0.00062 | | 0.00055 |
| | Iron (Fe)-Total (mg/L) | | 0.058 | | 0.292 | | 0.228 |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | | 0.000352 | | 0.000298 |
| | Lithium (Li)-Total (mg/L) | | 0.0053 | | 0.0021 | | 0.0021 |
| | Magnesium (Mg)-Total (mg/L) | | 18.4 | | 11.9 | | 12.4 |
| | Manganese (Mn)-Total (mg/L) | | 0.00487 | | 0.0187 | | 0.0177 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | 0.00101 | <0.00050 | 0.00094 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.000884 | | 0.000599 | | 0.000608 |
| | Nickel (Ni)-Total (mg/L) | | 0.00051 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Total (mg/L) | | 0.620 | | 0.620 | | 0.634 |
| | Selenium (Se)-Total (ug/L) | | 5.44 | | 0.631 | | 0.631 |
| | Silicon (Si)-Total (mg/L) | | 0.54 | | 2.63 | | 2.55 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 5.52 | | 4.98 | | 4.98 |
| | Strontium (Sr)-Total (mg/L) | | 0.177 | | 0.147 | | 0.147 |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.000929 | | 0.000707 | | 0.000718 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | | 0.0124 | | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | | LAB |
| | Dissolved Metals Filtration Location | | LAB | | LAB | | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | <0.0030 | | 0.0052 | | 0.0053 |
| | Antimony (Sb)-Dissolved (mg/L) | | 0.00013 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00021 | | 0.00040 | | 0.00043 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.103 | | 0.0414 | | 0.0423 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | 0.0060 | | <0.0050 | | <0.0050 |
| | Calcium (Ca)-Dissolved (mg/L) | | 54.8 | | 37.2 | | 36.6 |
| | Chromium (Cr)-Dissolved (mg/L) | | 0.00016 | | 0.00010 | | 0.00010 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-16 | L2270399-17 | L2270399-18 | | |
|-------------------------|---------------------------------------|--------------|-----------------------------------|-------------------------------|-------------------------------------|----------|--|
| | | Description | WS | WS | WS | | |
| | | Sampled Date | 07-MAY-19 | 08-MAY-19 | 08-MAY-19 | | |
| | | Sampled Time | 11:55 | 08:02 | 08:02 | | |
| | | Client ID | RG_DUP_WS_201 90507-1155 FB-HG | RG_ERIMF_WS_2 0190509-0802 | RG_ERIMF_WS_2 0190509-0802 FB-HG | | |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | | 62.1 | | | |
| | Chromium (Cr)-Total (mg/L) | | | 0.00030 | | | |
| | Cobalt (Co)-Total (ug/L) | | | 0.14 | | | |
| | Copper (Cu)-Total (mg/L) | | | 0.00055 | | | |
| | Iron (Fe)-Total (mg/L) | | | 0.138 | | | |
| | Lead (Pb)-Total (mg/L) | | | 0.000169 | | | |
| | Lithium (Li)-Total (mg/L) | | | 0.0044 | | | |
| | Magnesium (Mg)-Total (mg/L) | | | 11.0 | | | |
| | Manganese (Mn)-Total (mg/L) | | | 0.0404 | | | |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | 0.00057 | | <0.00050 | |
| | Molybdenum (Mo)-Total (mg/L) | | | 0.00129 | | | |
| | Nickel (Ni)-Total (mg/L) | | | 0.00105 | | | |
| | Potassium (K)-Total (mg/L) | | | 1.40 | | | |
| | Selenium (Se)-Total (ug/L) | | | 0.063 | | | |
| | Silicon (Si)-Total (mg/L) | | | 1.90 | | | |
| | Silver (Ag)-Total (mg/L) | | | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | | | 9.98 | | | |
| | Strontium (Sr)-Total (mg/L) | | | 0.169 | | | |
| | Thallium (Tl)-Total (mg/L) | | | <0.000010 | | | |
| | Tin (Sn)-Total (mg/L) | | | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | | | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | | | 0.000356 | | | |
| | Vanadium (V)-Total (mg/L) | | | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | | | 0.0087 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | LAB | | | |
| | Dissolved Metals Filtration Location | | | LAB | | | |
| | Aluminum (Al)-Dissolved (mg/L) | | | 0.0036 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | | | 0.00017 | | | |
| | Arsenic (As)-Dissolved (mg/L) | | | 0.00031 | | | |
| | Barium (Ba)-Dissolved (mg/L) | | | 0.155 | | | |
| | Beryllium (Be)-Dissolved (ug/L) | | | <0.020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | | | <0.010 | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | <0.0050 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | | | 62.4 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | | | 0.00022 | | | |
| | Cobalt (Co)-Dissolved (ug/L) | | | <0.10 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | Description | Sampled Date | Sampled Time | Client ID | L2270399-1 | L2270399-2 | L2270399-3 | L2270399-4 | L2270399-5 |
|-------------------------|----------------------------------|--------------|--------------|------------------------------|------------------------------|--|------------------------------|--|-----------------------------|
| | | | | | WS | WS | WS | WS | WS |
| | | 07-MAY-19 | 09:25 | RG_GO13_WS_20 190507-0925 | 07-MAY-19 09:25 | 07-MAY-19 09:25 | 07-MAY-19 13:00 | 07-MAY-19 13:00 | 07-MAY-19 13:00 |
| | | | | | RG_GO13_WS_20 190507-0925 | RG_GO13_WS_20 190507-0925 FB- HG | RG_GRLK_WS_20 190507-1300 | RG_GRLK_WS_20 190507-1300 FB- HG | RG_DUP_WS_201 90507-1300 |
| Grouping | Analyte | | | | | | | | |
| WATER | | | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | | | | <0.010 | | <0.010 | | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | | | | <0.000050 | | <0.000050 | | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | | | | 0.0284 | | 0.0030 | | 0.0031 |
| | Magnesium (Mg)-Dissolved (mg/L) | | | | 68.3 | | 17.8 | | 19.3 |
| | Manganese (Mn)-Dissolved (mg/L) | | | | 0.00896 | | <0.00010 | | <0.00010 |
| | Mercury (Hg)-Dissolved (mg/L) | | | | <0.0000050 | | <0.0000050 | | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | | 0.00229 | | 0.00136 | | 0.00130 |
| | Nickel (Ni)-Dissolved (mg/L) | | | | 0.00093 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | | | | 1.68 | | 0.930 | | 0.979 |
| | Selenium (Se)-Dissolved (ug/L) | | | | 86.6 | | 0.264 | | 0.262 |
| | Silicon (Si)-Dissolved (mg/L) | | | | 2.54 | | 2.41 | | 2.50 |
| | Silver (Ag)-Dissolved (mg/L) | | | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | | | | 8.51 | | 1.71 | | 1.81 |
| | Strontium (Sr)-Dissolved (mg/L) | | | | 0.395 | | 0.132 | | 0.131 |
| | Thallium (Tl)-Dissolved (mg/L) | | | | 0.000011 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | | | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | | | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | | | | 0.00329 | | 0.000814 | | 0.000807 |
| | Vanadium (V)-Dissolved (mg/L) | | | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | | | | <0.0010 | | <0.0010 | | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | L2270399-6 | L2270399-7 | L2270399-8 | L2270399-9 | L2270399-10 |
|-------------------------|-----------------------------------|------------------------------|-----------------------------|------------------------------|--|
| Description | WS | WS | WS | WS | WS |
| Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| Sampled Time | 13:00 | 12:00 | 13:00 | 13:45 | 13:45 |
| Client ID | RG_DUP_WS_201 90507-1300 FB-HG | RG_TRIP_WS_201 90507-0000 | RG_FBLANK_2019 0507-1300 | RG_EROL_WS_20 190507-1345 | RG_EROL_WS_20 190507-1345 FB- HG |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | <0.00050 | <0.00050 | |
| | Iron (Fe)-Dissolved (mg/L) | | <0.010 | <0.010 | |
| | Lead (Pb)-Dissolved (mg/L) | | <0.000050 | <0.000050 | |
| | Lithium (Li)-Dissolved (mg/L) | | <0.0010 | 0.0051 | |
| | Magnesium (Mg)-Dissolved (mg/L) | <0.0050 | <0.10 | 15.2 | |
| | Manganese (Mn)-Dissolved (mg/L) | | <0.00010 | 0.00151 | |
| | Mercury (Hg)-Dissolved (mg/L) | | <0.0000050 | <0.0000050 | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | <0.000050 | 0.000735 | |
| | Nickel (Ni)-Dissolved (mg/L) | | <0.00050 | <0.00050 | |
| | Potassium (K)-Dissolved (mg/L) | <0.050 | <0.050 | 0.537 | |
| | Selenium (Se)-Dissolved (ug/L) | | <0.050 | 3.55 | |
| | Silicon (Si)-Dissolved (mg/L) | | <0.050 | 2.11 | |
| | Silver (Ag)-Dissolved (mg/L) | | <0.000010 | <0.000010 | |
| | Sodium (Na)-Dissolved (mg/L) | <0.050 | <0.050 | 3.53 | |
| | Strontium (Sr)-Dissolved (mg/L) | | <0.00020 | 0.176 | |
| | Thallium (Tl)-Dissolved (mg/L) | | <0.000010 | <0.000010 | |
| | Tin (Sn)-Dissolved (mg/L) | | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Dissolved (mg/L) | | <0.010 | <0.010 | |
| | Uranium (U)-Dissolved (mg/L) | | <0.000010 | 0.000680 | |
| | Vanadium (V)-Dissolved (mg/L) | | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Dissolved (mg/L) | | <0.0010 | <0.0010 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-11 | L2270399-12 | L2270399-13 | L2270399-14 | L2270399-15 |
|-------------------------|----------------------------------|--------------|------------------------------|--|----------------------------|----------------------------------|-----------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 | 07-MAY-19 |
| | | Sampled Time | 14:36 | 14:36 | 11:55 | 11:55 | 11:55 |
| | | Client ID | RG_STPD_WS_20 190507-1436 | RG_STPD_WS_20 190507-1436 FB- HG | RG_ER_WS_2019 0507-1155 | RG_ER_WS_2019 0507-1155 FB-HG | RG_DUP_WS_201 90507-1155 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | | 0.0054 | | 0.0019 | | 0.0020 |
| | Magnesium (Mg)-Dissolved (mg/L) | | 17.6 | | 11.0 | | 11.7 |
| | Manganese (Mn)-Dissolved (mg/L) | | 0.00015 | | 0.00019 | | 0.00024 |
| | Mercury (Hg)-Dissolved (mg/L) | | <0.0000050 | | <0.0000050 | | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | | 0.000884 | | 0.000623 | | 0.000657 |
| | Nickel (Ni)-Dissolved (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | | 0.618 | | 0.556 | | 0.595 |
| | Selenium (Se)-Dissolved (ug/L) | | 6.54 | | 0.709 | | 0.671 |
| | Silicon (Si)-Dissolved (mg/L) | | 0.472 | | 2.25 | | 2.31 |
| | Silver (Ag)-Dissolved (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | | 5.31 | | 4.57 | | 4.84 |
| | Strontium (Sr)-Dissolved (mg/L) | | 0.174 | | 0.141 | | 0.146 |
| | Thallium (Tl)-Dissolved (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | | 0.000946 | | 0.000721 | | 0.000756 |
| | Vanadium (V)-Dissolved (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | | <0.0010 | | <0.0010 | | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2270399-16 | L2270399-17 | L2270399-18 | | |
|-------------------------|----------------------------------|--------------|-----------------------------------|-------------------------------|---|--|--|
| | | Description | WS | WS | WS | | |
| | | Sampled Date | 07-MAY-19 | 08-MAY-19 | 08-MAY-19 | | |
| | | Sampled Time | 11:55 | 08:02 | 08:02 | | |
| | | Client ID | RG_DUP_WS_201 90507-1155 FB-HG | RG_ERIMF_WS_2 0190509-0802 | RG_ERIMF_WS_2 0190509-0802 FB- HG | | |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | | | <0.010 | | | |
| | Lead (Pb)-Dissolved (mg/L) | | | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | | | 0.0045 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | | | 10.1 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | | | <0.00010 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | | | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | 0.00135 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | | | 0.00082 | | | |
| | Potassium (K)-Dissolved (mg/L) | | | 1.35 | | | |
| | Selenium (Se)-Dissolved (ug/L) | | | 0.063 | | | |
| | Silicon (Si)-Dissolved (mg/L) | | | 1.74 | | | |
| | Silver (Ag)-Dissolved (mg/L) | | | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | | | 9.41 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | | | 0.165 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | | | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | | | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | | | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | | | 0.000363 | | | |
| | Vanadium (V)-Dissolved (mg/L) | | | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | | | 0.0036 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|--|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Selenium (Se)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -8, -9 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -7, -8, -9 |
| Matrix Spike | Ammonia as N | MS-B | L2270399-1, -11, -13, -15, -17, -3, -5, -7, -8, -9 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| DLM | Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RRV | Reported Result Verified By Repeat Analysis |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved. | | | |
| C-TOT-ORG-LOW-CL | Water | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a | | | |

Reference Information

halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

Reference Information

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-CL Water pH APHA 4500 H-Electrode

pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-CL Water Total Dissolved Solids APHA 2540 C

A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS).

TECKCOAL-IONBAL-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = $[\text{Cation Sum} - \text{Anion Sum}] / [\text{Cation Sum} + \text{Anion Sum}]$

TKN-L-F-CL Water Total Kjeldahl Nitrogen APHA 4500-NORG (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.

TSS-L-CL Water Total Suspended Solids APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

TURBIDITY-CL Water Turbidity APHA 2130 B-Nephelometer

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-12

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2270399

Report Date: 17-MAY-19

Page 1 of 18

Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4635463 | | | | | | | |
| WG3050093-17 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 102.4 | | % | | 85-115 | 14-MAY-19 |
| WG3050093-16 | MB | | | | | | | |
| Acidity (as CaCO3) | | | <1.0 | | mg/L | | 2 | 14-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4635450 | | | | | | | |
| WG3050091-14 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 97.5 | | % | | 85-115 | 14-MAY-19 |
| WG3050091-17 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 99.7 | | % | | 85-115 | 14-MAY-19 |
| WG3050091-13 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 14-MAY-19 |
| WG3050091-16 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 14-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3048178-3 | DUP | L2270399-3 | | | | | | |
| Beryllium (Be)-Dissolved | | <0.000020 | <0.000020 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| WG3048178-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 94.3 | | % | | 80-120 | 13-MAY-19 |
| WG3048178-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 13-MAY-19 |
| WG3048178-4 | MS | L2270399-1 | | | | | | |
| Beryllium (Be)-Dissolved | | | 97.2 | | % | | 70-130 | 13-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3047572-3 | DUP | L2270399-1 | | | | | | |
| Beryllium (Be)-Total | | <0.000020 | <0.000020 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| WG3047572-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 97.1 | | % | | 80-120 | 13-MAY-19 |
| WG3047572-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 13-MAY-19 |
| WG3047572-4 | MS | L2270399-3 | | | | | | |
| Beryllium (Be)-Total | | | 94.1 | | % | | 70-130 | 13-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|-------------------|--------|-----------|-------|------|--------|-----------|
| BR-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4630541 | | | | | | | |
| WG3046588-7 | DUP | L2270399-7 | | | | | | |
| Bromide (Br) | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 09-MAY-19 |
| WG3046588-6 | LCS | | | | | | | |
| Bromide (Br) | | | 101.4 | | % | | 85-115 | 09-MAY-19 |
| WG3046588-5 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 09-MAY-19 |
| WG3046588-8 | MS | L2270399-7 | | | | | | |
| Bromide (Br) | | | 111.8 | | % | | 75-125 | 09-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4636743 | | | | | | | |
| WG3051957-3 | DUP | L2270399-1 | | | | | | |
| Dissolved Organic Carbon | | 2.44 | 1.67 | J | mg/L | 0.77 | 1 | 16-MAY-19 |
| WG3051957-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 108.4 | | % | | 80-120 | 16-MAY-19 |
| WG3051957-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 16-MAY-19 |
| WG3051957-4 | MS | L2270399-3 | | | | | | |
| Dissolved Organic Carbon | | | 105.5 | | % | | 70-130 | 16-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4636743 | | | | | | | |
| WG3051957-3 | DUP | L2270399-1 | | | | | | |
| Total Organic Carbon | | 2.51 | 2.46 | | mg/L | 2.4 | 20 | 16-MAY-19 |
| WG3051957-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 113.6 | | % | | 80-120 | 16-MAY-19 |
| WG3051957-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 16-MAY-19 |
| WG3051957-4 | MS | L2270399-3 | | | | | | |
| Total Organic Carbon | | | 103.1 | | % | | 70-130 | 16-MAY-19 |
| CL-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4630541 | | | | | | | |
| WG3046588-7 | DUP | L2270399-7 | | | | | | |
| Chloride (Cl) | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 09-MAY-19 |
| WG3046588-6 | LCS | | | | | | | |
| Chloride (Cl) | | | 98.6 | | % | | 90-110 | 09-MAY-19 |
| WG3046588-5 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 09-MAY-19 |
| WG3046588-8 | MS | L2270399-7 | | | | | | |
| Chloride (Cl) | | | 108.8 | | % | | 75-125 | 09-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed | |
|------------------------|------------|--------------------|------------|-----------|--------|------|----------|-----------|-----------|
| EC-L-PCT-CL | | Water | | | | | | | |
| Batch | R4635450 | | | | | | | | |
| WG3050091-14 | LCS | | | | | | | | |
| Conductivity (@ 25C) | | | 104.4 | | % | | 90-110 | 14-MAY-19 | |
| WG3050091-17 | LCS | | | | | | | | |
| Conductivity (@ 25C) | | | 104.2 | | % | | 90-110 | 14-MAY-19 | |
| WG3050091-13 | MB | | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 14-MAY-19 | |
| WG3050091-16 | MB | | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 14-MAY-19 | |
| F-IC-N-CL | | Water | | | | | | | |
| Batch | R4630541 | | | | | | | | |
| WG3046588-7 | DUP | L2270399-7 | | | | | | | |
| Fluoride (F) | | | <0.020 | <0.020 | RPD-NA | mg/L | N/A | 20 | 09-MAY-19 |
| WG3046588-6 | LCS | | | | | | | | |
| Fluoride (F) | | | 104.0 | | % | | 90-110 | 09-MAY-19 | |
| WG3046588-5 | MB | | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 09-MAY-19 | |
| WG3046588-8 | MS | L2270399-7 | | | | | | | |
| Fluoride (F) | | | 116.3 | | % | | 75-125 | 09-MAY-19 | |
| HG-D-CVAA-VA | | Water | | | | | | | |
| Batch | R4636746 | | | | | | | | |
| WG3051004-6 | LCS | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 99.5 | | % | | 80-120 | 16-MAY-19 | |
| WG3051004-5 | MB | LF | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 16-MAY-19 | |
| HG-T-U-CVAF-VA | | Water | | | | | | | |
| Batch | R4636498 | | | | | | | | |
| WG3051321-7 | DUP | L2270399-15 | | | | | | | |
| Mercury (Hg)-Total | | | 0.00094 | 0.00090 | | ug/L | 4.6 | 20 | 16-MAY-19 |
| WG3051321-2 | LCS | | | | | | | | |
| Mercury (Hg)-Total | | | 102.4 | | % | | 80-120 | 16-MAY-19 | |
| WG3051321-1 | MB | | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 16-MAY-19 | |
| WG3051321-8 | MS | L2270399-17 | | | | | | | |
| Mercury (Hg)-Total | | | 83.0 | | % | | 70-130 | 16-MAY-19 | |
| MET-D-CCMS-CL | | Water | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|------------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636652 | | | | | | | |
| WG3051795-2 | LCS | TMRM | | | | | | |
| Calcium (Ca)-Dissolved | | | 99.3 | | % | | 80-120 | 16-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 107.3 | | % | | 80-120 | 16-MAY-19 |
| Potassium (K)-Dissolved | | | 107.3 | | % | | 80-120 | 16-MAY-19 |
| Sodium (Na)-Dissolved | | | 99.0 | | % | | 80-120 | 16-MAY-19 |
| WG3051795-1 | MB | | | | | | | |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 16-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3048178-3 | DUP | L2270399-3 | | | | | | |
| Aluminum (Al)-Dissolved | | <0.0030 | <0.0030 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | 0.00042 | 0.00042 | | mg/L | 0.3 | 20 | 13-MAY-19 |
| Barium (Ba)-Dissolved | | 0.0569 | 0.0549 | | mg/L | 3.5 | 20 | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Boron (B)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | 35.6 | 36.1 | | mg/L | 1.2 | 20 | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | 0.0030 | 0.0030 | | mg/L | 0.6 | 20 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | 17.8 | 18.2 | | mg/L | 2.1 | 20 | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | 0.00136 | 0.00131 | | mg/L | 3.9 | 20 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Potassium (K)-Dissolved | | 0.930 | 0.926 | | mg/L | 0.4 | 20 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | 0.000264 | 0.000299 | | mg/L | 13 | 20 | 13-MAY-19 |
| Silicon (Si)-Dissolved | | 2.41 | 2.51 | | mg/L | 3.9 | 20 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|-----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3048178-3 | DUP | L2270399-3 | | | | | | |
| Sodium (Na)-Dissolved | | 1.71 | 1.77 | | mg/L | 3.6 | 20 | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | 0.132 | 0.128 | | mg/L | 3.1 | 20 | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Tin (Sn)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Uranium (U)-Dissolved | | 0.000814 | 0.000820 | | mg/L | 0.7 | 20 | 13-MAY-19 |
| Vanadium (V)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | <0.0010 | <0.0010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| WG3048178-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 102.7 | | % | | 80-120 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | | 103.0 | | % | | 80-120 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | | 100.2 | | % | | 80-120 | 13-MAY-19 |
| Barium (Ba)-Dissolved | | | 96.9 | | % | | 80-120 | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 101.8 | | % | | 80-120 | 13-MAY-19 |
| Boron (B)-Dissolved | | | 97.0 | | % | | 80-120 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 100.7 | | % | | 80-120 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | | 97.3 | | % | | 80-120 | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | | 103.1 | | % | | 80-120 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | | 98.9 | | % | | 80-120 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | | 99.9 | | % | | 80-120 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | | 92.6 | | % | | 80-120 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | | 97.5 | | % | | 80-120 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | | 92.8 | | % | | 80-120 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 106.6 | | % | | 80-120 | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | | 101.7 | | % | | 80-120 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 98.0 | | % | | 80-120 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | | 100.7 | | % | | 80-120 | 13-MAY-19 |
| Potassium (K)-Dissolved | | | 102.1 | | % | | 80-120 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | | 98.5 | | % | | 80-120 | 13-MAY-19 |
| Silicon (Si)-Dissolved | | | 98.4 | | % | | 60-140 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | | 91.5 | | % | | 80-120 | 13-MAY-19 |
| Sodium (Na)-Dissolved | | | 101.8 | | % | | 80-120 | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | | 96.5 | | % | | 80-120 | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | | 101.2 | | % | | 80-120 | 13-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3048178-2 | LCS | | | | | | | |
| Tin (Sn)-Dissolved | | | 94.3 | | % | | 80-120 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | | 99.2 | | % | | 80-120 | 13-MAY-19 |
| Uranium (U)-Dissolved | | | 96.9 | | % | | 80-120 | 13-MAY-19 |
| Vanadium (V)-Dissolved | | | 102.8 | | % | | 80-120 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | | 101.1 | | % | | 80-120 | 13-MAY-19 |
| WG3048178-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 13-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3048178-1 | MB | LF | | | | | | |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| WG3048178-4 | MS | L2270399-1 | | | | | | |
| Aluminum (Al)-Dissolved | | | 98.8 | | % | | 70-130 | 13-MAY-19 |
| Antimony (Sb)-Dissolved | | | 103.6 | | % | | 70-130 | 13-MAY-19 |
| Arsenic (As)-Dissolved | | | 112.2 | | % | | 70-130 | 13-MAY-19 |
| Barium (Ba)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 91.4 | | % | | 70-130 | 13-MAY-19 |
| Boron (B)-Dissolved | | | 105.3 | | % | | 70-130 | 13-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 103.9 | | % | | 70-130 | 13-MAY-19 |
| Calcium (Ca)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Chromium (Cr)-Dissolved | | | 98.1 | | % | | 70-130 | 13-MAY-19 |
| Cobalt (Co)-Dissolved | | | 91.9 | | % | | 70-130 | 13-MAY-19 |
| Copper (Cu)-Dissolved | | | 91.4 | | % | | 70-130 | 13-MAY-19 |
| Iron (Fe)-Dissolved | | | 93.2 | | % | | 70-130 | 13-MAY-19 |
| Lead (Pb)-Dissolved | | | 92.8 | | % | | 70-130 | 13-MAY-19 |
| Lithium (Li)-Dissolved | | | 93.5 | | % | | 70-130 | 13-MAY-19 |
| Magnesium (Mg)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Manganese (Mn)-Dissolved | | | 93.7 | | % | | 70-130 | 13-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 104.0 | | % | | 70-130 | 13-MAY-19 |
| Nickel (Ni)-Dissolved | | | 91.2 | | % | | 70-130 | 13-MAY-19 |
| Potassium (K)-Dissolved | | | 95.2 | | % | | 70-130 | 13-MAY-19 |
| Selenium (Se)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Silicon (Si)-Dissolved | | | 91.1 | | % | | 70-130 | 13-MAY-19 |
| Silver (Ag)-Dissolved | | | 94.5 | | % | | 70-130 | 13-MAY-19 |
| Sodium (Na)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Strontium (Sr)-Dissolved | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Thallium (Tl)-Dissolved | | | 92.4 | | % | | 70-130 | 13-MAY-19 |
| Tin (Sn)-Dissolved | | | 99.8 | | % | | 70-130 | 13-MAY-19 |
| Titanium (Ti)-Dissolved | | | 98.3 | | % | | 70-130 | 13-MAY-19 |
| Uranium (U)-Dissolved | | | 97.8 | | % | | 70-130 | 13-MAY-19 |
| Vanadium (V)-Dissolved | | | 99.7 | | % | | 70-130 | 13-MAY-19 |
| Zinc (Zn)-Dissolved | | | 96.0 | | % | | 70-130 | 13-MAY-19 |

MET-T-CCMS-VA

Water



Quality Control Report

Workorder: L2270399

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|-----------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3047572-3 | DUP | L2270399-1 | | | | | | |
| Aluminum (Al)-Total | | 0.0573 | 0.0596 | | mg/L | 4.1 | 20 | 13-MAY-19 |
| Antimony (Sb)-Total | | 0.00036 | 0.00037 | | mg/L | 1.0 | 20 | 13-MAY-19 |
| Arsenic (As)-Total | | 0.00018 | 0.00022 | | mg/L | 18 | 20 | 13-MAY-19 |
| Barium (Ba)-Total | | 0.0964 | 0.0950 | | mg/L | 1.5 | 20 | 13-MAY-19 |
| Bismuth (Bi)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Boron (B)-Total | | 0.022 | 0.022 | | mg/L | 0.3 | 20 | 13-MAY-19 |
| Cadmium (Cd)-Total | | 0.0000110 | 0.0000116 | | mg/L | 5.0 | 20 | 13-MAY-19 |
| Calcium (Ca)-Total | | 126 | 122 | | mg/L | 3.5 | 20 | 13-MAY-19 |
| Chromium (Cr)-Total | | 0.00013 | 0.00013 | | mg/L | 5.5 | 20 | 13-MAY-19 |
| Cobalt (Co)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Copper (Cu)-Total | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Iron (Fe)-Total | | 0.080 | 0.083 | | mg/L | 3.8 | 20 | 13-MAY-19 |
| Lead (Pb)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Lithium (Li)-Total | | 0.0283 | 0.0279 | | mg/L | 1.4 | 20 | 13-MAY-19 |
| Magnesium (Mg)-Total | | 72.6 | 72.2 | | mg/L | 0.5 | 20 | 13-MAY-19 |
| Manganese (Mn)-Total | | 0.0149 | 0.0149 | | mg/L | 0.5 | 20 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | 0.00215 | 0.00222 | | mg/L | 3.0 | 20 | 13-MAY-19 |
| Nickel (Ni)-Total | | 0.00100 | 0.00103 | | mg/L | 3.0 | 20 | 13-MAY-19 |
| Potassium (K)-Total | | 1.70 | 1.71 | | mg/L | 0.2 | 20 | 13-MAY-19 |
| Selenium (Se)-Total | | 0.0737 | 0.0726 | | mg/L | 1.6 | 20 | 13-MAY-19 |
| Silicon (Si)-Total | | 2.61 | 2.60 | | mg/L | 0.0 | 20 | 13-MAY-19 |
| Silver (Ag)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Sodium (Na)-Total | | 8.81 | 8.88 | | mg/L | 0.8 | 20 | 13-MAY-19 |
| Strontium (Sr)-Total | | 0.399 | 0.396 | | mg/L | 0.8 | 20 | 13-MAY-19 |
| Thallium (Tl)-Total | | 0.000013 | 0.000013 | | mg/L | 0.3 | 20 | 13-MAY-19 |
| Tin (Sn)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Titanium (Ti)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Uranium (U)-Total | | 0.00309 | 0.00322 | | mg/L | 4.1 | 20 | 13-MAY-19 |
| Vanadium (V)-Total | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 13-MAY-19 |
| Zinc (Zn)-Total | | 0.0030 | 0.0030 | | mg/L | 0.5 | 20 | 13-MAY-19 |
| WG3047572-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 103.9 | | % | | 80-120 | 13-MAY-19 |
| Antimony (Sb)-Total | | | 102.7 | | % | | 80-120 | 13-MAY-19 |
| Arsenic (As)-Total | | | 97.9 | | % | | 80-120 | 13-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3047572-2 | LCS | | | | | | | |
| Barium (Ba)-Total | | | 97.1 | | % | | 80-120 | 13-MAY-19 |
| Bismuth (Bi)-Total | | | 101.4 | | % | | 80-120 | 13-MAY-19 |
| Boron (B)-Total | | | 98.7 | | % | | 80-120 | 13-MAY-19 |
| Cadmium (Cd)-Total | | | 97.1 | | % | | 80-120 | 13-MAY-19 |
| Calcium (Ca)-Total | | | 95.9 | | % | | 80-120 | 13-MAY-19 |
| Chromium (Cr)-Total | | | 100.5 | | % | | 80-120 | 13-MAY-19 |
| Cobalt (Co)-Total | | | 97.2 | | % | | 80-120 | 13-MAY-19 |
| Copper (Cu)-Total | | | 97.6 | | % | | 80-120 | 13-MAY-19 |
| Iron (Fe)-Total | | | 92.1 | | % | | 80-120 | 13-MAY-19 |
| Lead (Pb)-Total | | | 97.4 | | % | | 80-120 | 13-MAY-19 |
| Lithium (Li)-Total | | | 96.9 | | % | | 80-120 | 13-MAY-19 |
| Magnesium (Mg)-Total | | | 107.5 | | % | | 80-120 | 13-MAY-19 |
| Manganese (Mn)-Total | | | 101.0 | | % | | 80-120 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | | 97.8 | | % | | 80-120 | 13-MAY-19 |
| Nickel (Ni)-Total | | | 97.6 | | % | | 80-120 | 13-MAY-19 |
| Potassium (K)-Total | | | 100.9 | | % | | 80-120 | 13-MAY-19 |
| Selenium (Se)-Total | | | 97.1 | | % | | 80-120 | 13-MAY-19 |
| Silicon (Si)-Total | | | 100.4 | | % | | 80-120 | 13-MAY-19 |
| Silver (Ag)-Total | | | 90.6 | | % | | 80-120 | 13-MAY-19 |
| Sodium (Na)-Total | | | 99.5 | | % | | 80-120 | 13-MAY-19 |
| Strontium (Sr)-Total | | | 95.4 | | % | | 80-120 | 13-MAY-19 |
| Thallium (Tl)-Total | | | 100.1 | | % | | 80-120 | 13-MAY-19 |
| Tin (Sn)-Total | | | 93.4 | | % | | 80-120 | 13-MAY-19 |
| Titanium (Ti)-Total | | | 97.4 | | % | | 80-120 | 13-MAY-19 |
| Uranium (U)-Total | | | 95.6 | | % | | 80-120 | 13-MAY-19 |
| Vanadium (V)-Total | | | 100.6 | | % | | 80-120 | 13-MAY-19 |
| Zinc (Zn)-Total | | | 99.7 | | % | | 80-120 | 13-MAY-19 |
| WG3047572-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 13-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |



Quality Control Report

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3047572-1 | MB | | | | | | | |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 13-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 13-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 13-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 13-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 13-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 13-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 13-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 13-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 13-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 13-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 13-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 13-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 13-MAY-19 |
| WG3047572-4 | MS | L2270399-3 | | | | | | |
| Aluminum (Al)-Total | | | 92.9 | | % | | 70-130 | 13-MAY-19 |
| Antimony (Sb)-Total | | | 97.1 | | % | | 70-130 | 13-MAY-19 |
| Arsenic (As)-Total | | | 99.7 | | % | | 70-130 | 13-MAY-19 |
| Barium (Ba)-Total | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Bismuth (Bi)-Total | | | 95.1 | | % | | 70-130 | 13-MAY-19 |
| Boron (B)-Total | | | 104.3 | | % | | 70-130 | 13-MAY-19 |
| Cadmium (Cd)-Total | | | 97.5 | | % | | 70-130 | 13-MAY-19 |
| Calcium (Ca)-Total | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Chromium (Cr)-Total | | | 98.6 | | % | | 70-130 | 13-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4633446 | | | | | | | |
| WG3047572-4 | MS | L2270399-3 | | | | | | |
| Cobalt (Co)-Total | | | 93.6 | | % | | 70-130 | 13-MAY-19 |
| Copper (Cu)-Total | | | 94.2 | | % | | 70-130 | 13-MAY-19 |
| Iron (Fe)-Total | | | 97.2 | | % | | 70-130 | 13-MAY-19 |
| Lead (Pb)-Total | | | 94.0 | | % | | 70-130 | 13-MAY-19 |
| Lithium (Li)-Total | | | 93.8 | | % | | 70-130 | 13-MAY-19 |
| Magnesium (Mg)-Total | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Manganese (Mn)-Total | | | 95.6 | | % | | 70-130 | 13-MAY-19 |
| Molybdenum (Mo)-Total | | | 99.8 | | % | | 70-130 | 13-MAY-19 |
| Nickel (Ni)-Total | | | 93.4 | | % | | 70-130 | 13-MAY-19 |
| Potassium (K)-Total | | | 99.3 | | % | | 70-130 | 13-MAY-19 |
| Selenium (Se)-Total | | | 101.5 | | % | | 70-130 | 13-MAY-19 |
| Silicon (Si)-Total | | | 89.3 | | % | | 70-130 | 13-MAY-19 |
| Silver (Ag)-Total | | | 96.5 | | % | | 70-130 | 13-MAY-19 |
| Sodium (Na)-Total | | | 91.2 | | % | | 70-130 | 13-MAY-19 |
| Strontium (Sr)-Total | | | N/A | MS-B | % | | - | 13-MAY-19 |
| Thallium (Tl)-Total | | | 93.2 | | % | | 70-130 | 13-MAY-19 |
| Tin (Sn)-Total | | | 96.7 | | % | | 70-130 | 13-MAY-19 |
| Titanium (Ti)-Total | | | 92.4 | | % | | 70-130 | 13-MAY-19 |
| Uranium (U)-Total | | | 96.0 | | % | | 70-130 | 13-MAY-19 |
| Vanadium (V)-Total | | | 99.4 | | % | | 70-130 | 13-MAY-19 |
| Zinc (Zn)-Total | | | 97.3 | | % | | 70-130 | 13-MAY-19 |
| Batch | R4634642 | | | | | | | |
| WG3048697-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 100.2 | | % | | 80-120 | 14-MAY-19 |
| Antimony (Sb)-Total | | | 100.3 | | % | | 80-120 | 14-MAY-19 |
| Arsenic (As)-Total | | | 96.1 | | % | | 80-120 | 14-MAY-19 |
| Barium (Ba)-Total | | | 100.4 | | % | | 80-120 | 14-MAY-19 |
| Bismuth (Bi)-Total | | | 104.0 | | % | | 80-120 | 14-MAY-19 |
| Boron (B)-Total | | | 96.1 | | % | | 80-120 | 14-MAY-19 |
| Cadmium (Cd)-Total | | | 96.8 | | % | | 80-120 | 14-MAY-19 |
| Calcium (Ca)-Total | | | 98.2 | | % | | 80-120 | 14-MAY-19 |
| Chromium (Cr)-Total | | | 99.7 | | % | | 80-120 | 14-MAY-19 |
| Cobalt (Co)-Total | | | 97.3 | | % | | 80-120 | 14-MAY-19 |
| Copper (Cu)-Total | | | 97.2 | | % | | 80-120 | 14-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634642 | | | | | | | |
| WG3048697-2 | LCS | | | | | | | |
| Iron (Fe)-Total | | | 97.6 | | % | | 80-120 | 14-MAY-19 |
| Lead (Pb)-Total | | | 98.0 | | % | | 80-120 | 14-MAY-19 |
| Lithium (Li)-Total | | | 94.0 | | % | | 80-120 | 14-MAY-19 |
| Magnesium (Mg)-Total | | | 102.5 | | % | | 80-120 | 14-MAY-19 |
| Manganese (Mn)-Total | | | 98.0 | | % | | 80-120 | 14-MAY-19 |
| Molybdenum (Mo)-Total | | | 96.4 | | % | | 80-120 | 14-MAY-19 |
| Nickel (Ni)-Total | | | 97.7 | | % | | 80-120 | 14-MAY-19 |
| Potassium (K)-Total | | | 96.8 | | % | | 80-120 | 14-MAY-19 |
| Selenium (Se)-Total | | | 99.2 | | % | | 80-120 | 14-MAY-19 |
| Silicon (Si)-Total | | | 104.2 | | % | | 80-120 | 14-MAY-19 |
| Silver (Ag)-Total | | | 94.1 | | % | | 80-120 | 14-MAY-19 |
| Sodium (Na)-Total | | | 102.6 | | % | | 80-120 | 14-MAY-19 |
| Strontium (Sr)-Total | | | 99.0 | | % | | 80-120 | 14-MAY-19 |
| Thallium (Tl)-Total | | | 98.5 | | % | | 80-120 | 14-MAY-19 |
| Tin (Sn)-Total | | | 97.4 | | % | | 80-120 | 14-MAY-19 |
| Titanium (Ti)-Total | | | 94.5 | | % | | 80-120 | 14-MAY-19 |
| Uranium (U)-Total | | | 101.1 | | % | | 80-120 | 14-MAY-19 |
| Vanadium (V)-Total | | | 99.3 | | % | | 80-120 | 14-MAY-19 |
| Zinc (Zn)-Total | | | 97.1 | | % | | 80-120 | 14-MAY-19 |
| WG3048697-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 14-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 14-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634642 | | | | | | | |
| WG3048697-1 | MB | | | | | | | |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 14-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 14-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 14-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 14-MAY-19 |
| NH3-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4635287 | | | | | | | |
| WG3050204-7 | DUP | L2270399-17 | | | | | | |
| Ammonia as N | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050204-10 | LCS | | | | | | | |
| Ammonia as N | | | 91.7 | | % | | 85-115 | 14-MAY-19 |
| WG3050204-14 | LCS | | | | | | | |
| Ammonia as N | | | 90.3 | | % | | 85-115 | 14-MAY-19 |
| WG3050204-2 | LCS | | | | | | | |
| Ammonia as N | | | 94.3 | | % | | 85-115 | 14-MAY-19 |
| WG3050204-6 | LCS | | | | | | | |
| Ammonia as N | | | 91.7 | | % | | 85-115 | 14-MAY-19 |
| WG3050204-1 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| WG3050204-13 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| WG3050204-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| WG3050204-9 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------|----------------------|---------|-----------|-------|-----|---------|-----------|
| PH-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4635450 | | | | | | | | |
| WG3050091-14 LCS | | | | | | | | |
| pH | | | 7.00 | | pH | | 6.9-7.1 | 14-MAY-19 |
| WG3050091-17 LCS | | | | | | | | |
| pH | | | 7.00 | | pH | | 6.9-7.1 | 14-MAY-19 |
| PO4-DO-L-COL-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4630586 | | | | | | | | |
| WG3045960-10 LCS | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 102.4 | | % | | 80-120 | 09-MAY-19 |
| WG3045960-9 MB | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 09-MAY-19 |
| SO4-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4630541 | | | | | | | | |
| WG3046588-7 DUP | | | | | | | | |
| Sulfate (SO4) | | L2270399-7 <0.30 | <0.30 | RPD-NA | mg/L | N/A | 20 | 09-MAY-19 |
| WG3046588-6 LCS | | | | | | | | |
| Sulfate (SO4) | | | 100.1 | | % | | 90-110 | 09-MAY-19 |
| WG3046588-5 MB | | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 09-MAY-19 |
| WG3046588-8 MS | | | | | | | | |
| Sulfate (SO4) | | L2270399-7 | 110.0 | | % | | 75-125 | 09-MAY-19 |
| SOLIDS-TDS-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4634892 | | | | | | | | |
| WG3047948-14 LCS | | | | | | | | |
| Total Dissolved Solids | | | 95.5 | | % | | 85-115 | 13-MAY-19 |
| WG3047948-13 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 13-MAY-19 |
| TKN-L-F-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4636142 | | | | | | | | |
| WG3051214-7 DUP | | | | | | | | |
| Total Kjeldahl Nitrogen | | L2270399-7 <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 15-MAY-19 |
| WG3051214-10 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 89.7 | | % | | 75-125 | 15-MAY-19 |
| WG3051214-14 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 89.3 | | % | | 75-125 | 15-MAY-19 |
| WG3051214-18 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 89.7 | | % | | 75-125 | 15-MAY-19 |
| WG3051214-2 LCS | | | | | | | | |



Quality Control Report

Workorder: L2270399

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| TKN-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636142 | | | | | | | |
| WG3051214-2 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.9 | | % | | 75-125 | 15-MAY-19 |
| WG3051214-6 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 90.0 | | % | | 75-125 | 15-MAY-19 |
| WG3051214-1 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 15-MAY-19 |
| WG3051214-13 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 15-MAY-19 |
| WG3051214-17 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 15-MAY-19 |
| WG3051214-5 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 15-MAY-19 |
| WG3051214-8 | MS | L2270399-7 | | | | | | |
| Total Kjeldahl Nitrogen | | | 97.5 | | % | | 70-130 | 15-MAY-19 |
| TSS-L-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634811 | | | | | | | |
| WG3048017-23 | LCS | | | | | | | |
| Total Suspended Solids | | | 99.8 | | % | | 85-115 | 13-MAY-19 |
| WG3048017-25 | LCS | | | | | | | |
| Total Suspended Solids | | | 92.9 | | % | | 85-115 | 13-MAY-19 |
| WG3048017-22 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 13-MAY-19 |
| WG3048017-24 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 13-MAY-19 |
| TURBIDITY-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4630303 | | | | | | | |
| WG3046239-21 | DUP | L2270399-3 | | | | | | |
| Turbidity | | 2.46 | 2.81 | | NTU | 13 | 15 | 09-MAY-19 |
| WG3046239-17 | LCS | | | | | | | |
| Turbidity | | | 95.5 | | % | | 85-115 | 09-MAY-19 |
| WG3046239-20 | LCS | | | | | | | |
| Turbidity | | | 95.5 | | % | | 85-115 | 09-MAY-19 |
| WG3046239-16 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 09-MAY-19 |
| WG3046239-19 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 09-MAY-19 |

Quality Control Report

Workorder: L2270399

Report Date: 17-MAY-19

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2270399

Report Date: 17-MAY-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | | | | | | | |
| | 1 | 07-MAY-19 09:25 | 13-MAY-19 16:50 | 0.25 | 151 | hours | EHTR-FM |
| | 3 | 07-MAY-19 13:00 | 13-MAY-19 16:50 | 0.25 | 148 | hours | EHTR-FM |
| | 5 | 07-MAY-19 13:00 | 13-MAY-19 16:50 | 0.25 | 148 | hours | EHTR-FM |
| | 7 | 07-MAY-19 12:00 | 13-MAY-19 16:50 | 0.25 | 149 | hours | EHTR-FM |
| | 8 | 07-MAY-19 13:00 | 13-MAY-19 16:50 | 0.25 | 148 | hours | EHTR-FM |
| | 9 | 07-MAY-19 13:45 | 13-MAY-19 16:50 | 0.25 | 147 | hours | EHTR-FM |
| | 11 | 07-MAY-19 14:36 | 13-MAY-19 16:50 | 0.25 | 146 | hours | EHTR-FM |
| | 13 | 07-MAY-19 11:55 | 13-MAY-19 16:50 | 0.25 | 149 | hours | EHTR-FM |
| | 15 | 07-MAY-19 11:55 | 13-MAY-19 16:50 | 0.25 | 149 | hours | EHTR-FM |
| | 17 | 08-MAY-19 08:02 | 13-MAY-19 16:50 | 0.25 | 129 | hours | EHTR-FM |
| pH | | | | | | | |
| | 1 | 07-MAY-19 09:25 | 14-MAY-19 09:00 | 0.25 | 168 | hours | EHTR-FM |
| | 3 | 07-MAY-19 13:00 | 14-MAY-19 09:00 | 0.25 | 164 | hours | EHTR-FM |
| | 5 | 07-MAY-19 13:00 | 14-MAY-19 09:00 | 0.25 | 164 | hours | EHTR-FM |
| | 7 | 07-MAY-19 12:00 | 14-MAY-19 09:00 | 0.25 | 165 | hours | EHTR-FM |
| | 8 | 07-MAY-19 13:00 | 14-MAY-19 09:00 | 0.25 | 164 | hours | EHTR-FM |
| | 9 | 07-MAY-19 13:45 | 14-MAY-19 09:00 | 0.25 | 163 | hours | EHTR-FM |
| | 11 | 07-MAY-19 14:36 | 14-MAY-19 09:00 | 0.25 | 162 | hours | EHTR-FM |
| | 13 | 07-MAY-19 11:55 | 14-MAY-19 09:00 | 0.25 | 165 | hours | EHTR-FM |
| | 15 | 07-MAY-19 11:55 | 14-MAY-19 09:00 | 0.25 | 165 | hours | EHTR-FM |
| | 17 | 08-MAY-19 08:02 | 14-MAY-19 09:00 | 0.25 | 145 | hours | EHTR-FM |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:
 Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
 Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2270399 were received on 09-MAY-19 10:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

COC ID:

REP-Lentic 19-12

TURNAROUND TIME:

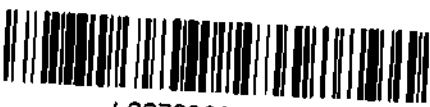
| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
|----------------------|--------------------------------|----------|--------|--------------|-------------------------------|----------|--------|
| Facility Name / Job# | Regional Effects Program (REP) | | | Lab Name | ALS Calgary | | |
| Project Manager | Cail Good | | | Lab Contact | Lyndmyla Shvets | | |
| Email | cail.good@teck.com | | | Email | lyudmyla.shvets@alsglobal.com | | |
| Address | 421 Pine Avenue | | | Address | 2559 29 Street NE | | |
| City | Sparwood | Province | BC | City | Calgary | Province | AB |
| Postal Code | V0B 2G0 | Country | Canada | Postal Code | T1Y 7B5 | Country | Canada |
| Phone Number | 250-425-8202 | | | Phone Number | 1 403 407 1794 | | |

SAMPLE DETAILS

ANALYSIS REQUESTED

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA |
|--------------------------------|-----------------|--------------|-----------------------------|----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|
| RG_GO13_WS_20190507-0925 | RG_GO13 | WS | No | 7-May-19 | 0925 | G | 7 | X | X | X | X | X | X | X |
| RG_GO13_WS_20190507-0925 FB-HG | RG_GO13 | WS | No | 7-May-19 | 0925 | G | 1 | | | | X | | | |
| RG_GRLK_WS_20190507-1300 | RG_GRLK | WS | No | 7-May-19 | 1300 | G | 7 | X | X | X | X | X | X | X |
| RG_GRLK_WS_20190507-1300 FB-HG | RG_GRLK | WS | No | 7-May-19 | 1300 | G | 1 | | | | X | | | |
| RG_DUP_WS_20190507-1300 | RG_DUP | WS | No | 7-May-19 | 1300 | G | 7 | X | X | X | X | X | X | X |
| RG_DUP_WS_20190507-1300 FB-HG | RG_DUP | WS | No | 7-May-19 | 1300 | G | 1 | | | | X | | | |
| RG_TRIP_WS_20190507-0000 | RG_TRIP | WS | No | 7-May-19 | 0000 | G | 7 | X | X | X | X | X | X | X |
| RG_FBLANK_20190507-1300 | RG_FBLANK | WS | No | 7-May-19 | 1300 | G | 7 | X | X | X | X | X | X | X |
| RG_EROL_WS_20190507-1345 | RG_EROL | WS | No | 7-May-19 | 1345 | G | 7 | X | X | X | X | X | X | X |
| RG_EROL_WS_20190507-1345 FB-HG | RG_EROL | WS | No | 7-May-19 | 1345 | G | 1 | | | | X | | | |
| RG_STPD_WS_20190507-1436 | RG_STPD | WS | No | 7-May-19 | 1436 | G | 7 | X | X | X | X | X | X | X |
| RG_STPD_WS_20190507-1436 FB-HG | RG_STPD | WS | No | 7-May-19 | 1436 | G | 1 | | | | X | | | |
| RG_ER_WS_20190507-1155 | RG_ER | WS | No | 7-May-19 | 1155 | G | 7 | X | X | X | X | X | X | X |
| RG_ER_WS_20190507-1155 FB-HG | RG_ER | WS | No | 7-MAY-19 | 1155 | G | 1 | | | | X | | | |
| RG_DUP_WS_20190507-1155 | RG DUP | WS | No | 7-May-19 | 1155 | G | 7 | X | X | X | X | X | X | X |
| RG_DUP_WS_20190507-1155 FB-HG | RG_DUP | WS | No | 7-May-19 | 1155 | G | 1 | | | | X | | | |

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L2270399-COFC

| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | REINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
|---|----------------------------|-----------|-----------------------------|
| For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample? | | | <i>[Signature]</i> S/A 1000 |
| NO OF BOTTLES RETURNED/DESCRIPTION | Sampler's Name | Mobile # | |
| Regular (default) x | Sampler's Signature | Date/Time | |
| Priority (2-3 business days) - 50% surcharge | | | |
| Emergency (1 Business Day) - 100% surcharge | | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | | |

| | | | | | | | | | | | | | | | | | | | | |
|----------------------|--|--------------------------------|--|--|--|------------------|--------|--|--|--------------|--|-------------------------------|--|----------|--------|--|--|-----------------------|-----|-----|
| COC ID: | | REP-Lentic 19-12 | | | | TURNAROUND TIME: | | | | | | | | | | | | | | |
| PROJECT/CLIENT INFO | | | | | | | | | | LABORATORY | | | | | | | | | | |
| Facility Name / Job# | | Regional Effects Program (REP) | | | | | | | | Lab Name | | ALS Calgary | | | | | | Excel | PDF | EDD |
| Project Manager | | Cait Good | | | | | | | | Lab Contact | | Lyudmyla Shvets | | | | | | | | |
| Email | | cait.good@teck.com | | | | | | | | Email | | lyudmyla.shvets@alsglobal.com | | | | | | cait.good@teck.com | | |
| Address | | 421 Pine Avenue | | | | | | | | Address | | 2559 29 Street NE | | | | | | teckcoal@equinise.com | | |
| City | | Sparwood | | | | Province | BC | | | City | | Calgary | | Province | AB | | | | | |
| Postal Code | | V0B 2G0 | | | | Country | Canada | | | Postal Code | | T1Y 7B5 | | Country | Canada | | | | | |
| Phone Number | | 250-425-8282 | | | | | | | | Phone Number | | 1 403 407 1794 | | | | | | | | |

SAMPLE DETAILS

ANALYSIS REQUESTED



L2270399-COFC

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | Filtered - F1 | Field | FL2 | Met A | Lab. B | Name |
|---------------------------------|-----------------|--------------|-----------------------------|----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|---------------|-------|-----|-------|--------|------|
| RG_ERIMF_WS_20190509-0803 | RG_ERIMF | WS | No | 8-May-19 | 0802 | G | 7 | X | X | X | X | X | X | X | | | | | | |
| RG_ERIMF_WS_20190509-0802 FB-HC | RG_ERIMF | WS | No | 8-May-19 | 0802 | G | 1 | | | | X | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | | |

| | | | | | | | |
|---|--|-----------------------------|--|-----------|--|-------------------------|--|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | | RELINQUISHED BY/AFFILIATION | | DATE/TIME | | ACCEPTED BY/AFFILIATION | |
| | | | | | | 5/9 1000 | |
| NB OF BOTTLES RETURNED/DESCRIPTION | | Sampler's Name | | Mobile # | | | |
| Regular (default) * Priority (2-3 business days) - 50% surcharge Emergency (1 Business Day) - 100% surcharge For Emergency <1 Day, ASAP or Weekend - Contact ALS | | Sampler's Signature | | Date/Time | | | |



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 10-MAY-19
Report Date: 17-MAY-19 17:02 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2271140
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-12 - 2
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | L2271140-1 | L2271140-2 | | | |
|-----------------------------------|---|--|------|--|--|
| Description | WS | WS | | | |
| Sampled Date | 08-MAY-19 | 08-MAY-19 | | | |
| Sampled Time | 17:02 | 17:02 | | | |
| Client ID | RG_LNLK_WS_20 190508-1702 | RG_LNLK_WS_20 190508-1702 FB- HG | | | |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 257 | | | |
| | Hardness (as CaCO3) (mg/L) | 132 | | | |
| | pH (pH) | 8.31 | | | |
| | ORP (mV) | 476 | | | |
| | Total Suspended Solids (mg/L) | 3.3 | | | |
| | Total Dissolved Solids (mg/L) | 146 | DLHC | | |
| | Turbidity (NTU) | 1.91 | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 130 | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | 1.8 | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | 132 | | | |
| | Ammonia as N (mg/L) | 0.0315 | | | |
| | Bromide (Br) (mg/L) | <0.050 | | | |
| | Chloride (Cl) (mg/L) | 2.62 | | | |
| | Fluoride (F) (mg/L) | 0.062 | | | |
| | Ion Balance (%) | 102 | | | |
| | Nitrate (as N) (mg/L) | <0.0050 | | | |
| | Nitrite (as N) (mg/L) | <0.0010 | | | |
| | Total Kjeldahl Nitrogen (mg/L) | 0.938 | | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0120 | | | |
| | Sulfate (SO4) (mg/L) | 3.21 | | | |
| | Anion Sum (meq/L) | 2.78 | | | |
| | Cation Sum (meq/L) | 2.84 | | | |
| | Cation - Anion Balance (%) | 0.9 | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 8.20 | | | |
| | Total Organic Carbon (mg/L) | 8.43 | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0049 | | | |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | | | |
| | Arsenic (As)-Total (mg/L) | 0.00046 | | | |
| | Barium (Ba)-Total (mg/L) | 0.199 | | | |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | | |
| | Boron (B)-Total (mg/L) | <0.010 | | | |
| | Cadmium (Cd)-Total (ug/L) | <0.0050 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2271140-1 WS 08-MAY-19 17:02 RG_LNLK_WS_20 190508-1702 | L2271140-2 WS 08-MAY-19 17:02 RG_LNLK_WS_20 190508-1702 FB- HG | | |
|-------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | 25.9 | | | |
| | Chromium (Cr)-Total (mg/L) | <0.00010 | | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | | | |
| | Copper (Cu)-Total (mg/L) | <0.00050 | | | |
| | Iron (Fe)-Total (mg/L) | <0.010 | | | |
| | Lead (Pb)-Total (mg/L) | <0.000050 | | | |
| | Lithium (Li)-Total (mg/L) | 0.0014 | | | |
| | Magnesium (Mg)-Total (mg/L) | 15.7 | | | |
| | Manganese (Mn)-Total (mg/L) | 0.00513 | | | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.000337 | | | |
| | Nickel (Ni)-Total (mg/L) | <0.00050 | | | |
| | Potassium (K)-Total (mg/L) | 1.18 | | | |
| | Selenium (Se)-Total (ug/L) | <0.050 | | | |
| | Silicon (Si)-Total (mg/L) | 1.15 | | | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | 4.02 | | | |
| | Strontium (Sr)-Total (mg/L) | 0.0729 | | | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | 0.000232 | | | |
| | Vanadium (V)-Total (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | 0.0039 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | | | |
| | Dissolved Metals Filtration Location | LAB | | | |
| | Aluminum (Al)-Dissolved (mg/L) | <0.0030 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00052 | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.191 | | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | <0.010 | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | <0.0050 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 26.9 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2271140-1 | L2271140-2 | | |
|-------------------------|----------------------------------|--------------|------------------------------|--|--|--|
| | | Description | WS | WS | | |
| | | Sampled Date | 08-MAY-19 | 08-MAY-19 | | |
| | | Sampled Time | 17:02 | 17:02 | | |
| | | Client ID | RG_LNLK_WS_20 190508-1702 | RG_LNLK_WS_20 190508-1702 FB- HG | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | | <0.010 | | | |
| | Lead (Pb)-Dissolved (mg/L) | | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | | 0.0015 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | | 15.7 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | | 0.00011 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | 0.000343 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | | <0.00050 | | | |
| | Potassium (K)-Dissolved (mg/L) | | 1.26 | | | |
| | Selenium (Se)-Dissolved (ug/L) | | <0.050 | | | |
| | Silicon (Si)-Dissolved (mg/L) | | 1.12 | | | |
| | Silver (Ag)-Dissolved (mg/L) | | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | | 3.95 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | | 0.0714 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | | 0.000263 | | | |
| | Vanadium (V)-Dissolved (mg/L) | | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | | <0.0010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2271140-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2271140-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2271140-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2271140-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2271140-1 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2271140-1 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2271140-1 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2271140-1 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2271140-1 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved. | | | |
| C-TOT-ORG-LOW-CL | Water | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by | | | |

Reference Information

subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$$

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

Reference Information

| | | | |
|---|-------|---------------------------------|--------------------------|
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-12 - 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

Page 1 of 10

Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636618 | | | | | | | |
| WG3051277-11 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 104.7 | | % | | 85-115 | 15-MAY-19 |
| WG3051277-10 | MB | | | | | | | |
| Acidity (as CaCO3) | | | 1.4 | | mg/L | | 2 | 15-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636590 | | | | | | | |
| WG3051280-8 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 96.2 | | % | | 85-115 | 15-MAY-19 |
| WG3051280-7 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 15-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 99.8 | | % | | 80-120 | 14-MAY-19 |
| WG3048893-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 14-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 88.4 | | % | | 80-120 | 12-MAY-19 |
| WG3047525-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 12-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Bromide (Br) | | | 104.0 | | % | | 85-115 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 10-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637537 | | | | | | | |
| WG3052922-6 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 100.9 | | % | | 80-120 | 17-MAY-19 |
| WG3052922-5 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 17-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|--------------|-----------|------------|-----------|-------|-----|----------|-----------|
| C-TOT-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4637537 | | | | | | | |
| WG3052922-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 108.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052922-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 17-MAY-19 |
| CL-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Chloride (Cl) | | | 102.5 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 10-MAY-19 |
| EC-L-PCT-CL | Water | | | | | | | |
| Batch | R4636590 | | | | | | | |
| WG3051280-8 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 103.9 | | % | | 90-110 | 15-MAY-19 |
| WG3051280-7 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 15-MAY-19 |
| F-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Fluoride (F) | | | 107.6 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 10-MAY-19 |
| HG-D-CVAA-VA | Water | | | | | | | |
| Batch | R4635213 | | | | | | | |
| WG3049627-6 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 102.6 | | % | | 80-120 | 15-MAY-19 |
| WG3049627-5 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 15-MAY-19 |
| HG-T-U-CVAF-VA | Water | | | | | | | |
| Batch | R4637338 | | | | | | | |
| WG3052736-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 115.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052736-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 17-MAY-19 |
| MET-D-CCMS-VA | Water | | | | | | | |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 101.4 | | % | | 80-120 | 14-MAY-19 |
| Antimony (Sb)-Dissolved | | | 100.1 | | % | | 80-120 | 14-MAY-19 |
| Arsenic (As)-Dissolved | | | 94.9 | | % | | 80-120 | 14-MAY-19 |
| Barium (Ba)-Dissolved | | | 89.7 | | % | | 80-120 | 14-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 98.0 | | % | | 80-120 | 14-MAY-19 |
| Boron (B)-Dissolved | | | 97.1 | | % | | 80-120 | 14-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 92.9 | | % | | 80-120 | 14-MAY-19 |
| Calcium (Ca)-Dissolved | | | 99.2 | | % | | 80-120 | 14-MAY-19 |
| Chromium (Cr)-Dissolved | | | 98.7 | | % | | 80-120 | 14-MAY-19 |
| Cobalt (Co)-Dissolved | | | 94.1 | | % | | 80-120 | 14-MAY-19 |
| Copper (Cu)-Dissolved | | | 95.8 | | % | | 80-120 | 14-MAY-19 |
| Iron (Fe)-Dissolved | | | 95.4 | | % | | 80-120 | 14-MAY-19 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 14-MAY-19 |
| Lithium (Li)-Dissolved | | | 102.3 | | % | | 80-120 | 14-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 107.3 | | % | | 80-120 | 14-MAY-19 |
| Manganese (Mn)-Dissolved | | | 98.7 | | % | | 80-120 | 14-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 97.3 | | % | | 80-120 | 14-MAY-19 |
| Nickel (Ni)-Dissolved | | | 97.6 | | % | | 80-120 | 14-MAY-19 |
| Potassium (K)-Dissolved | | | 105.7 | | % | | 80-120 | 14-MAY-19 |
| Selenium (Se)-Dissolved | | | 93.9 | | % | | 80-120 | 14-MAY-19 |
| Silicon (Si)-Dissolved | | | 102.3 | | % | | 60-140 | 14-MAY-19 |
| Silver (Ag)-Dissolved | | | 93.4 | | % | | 80-120 | 14-MAY-19 |
| Sodium (Na)-Dissolved | | | 99.9 | | % | | 80-120 | 14-MAY-19 |
| Strontium (Sr)-Dissolved | | | 96.8 | | % | | 80-120 | 14-MAY-19 |
| Thallium (Tl)-Dissolved | | | 96.5 | | % | | 80-120 | 14-MAY-19 |
| Tin (Sn)-Dissolved | | | 93.1 | | % | | 80-120 | 14-MAY-19 |
| Titanium (Ti)-Dissolved | | | 96.9 | | % | | 80-120 | 14-MAY-19 |
| Uranium (U)-Dissolved | | | 99.8 | | % | | 80-120 | 14-MAY-19 |
| Vanadium (V)-Dissolved | | | 100.8 | | % | | 80-120 | 14-MAY-19 |
| Zinc (Zn)-Dissolved | | | 95.1 | | % | | 80-120 | 14-MAY-19 |
| WG3048893-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-1 | MB | LF | | | | | | |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 14-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 14-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 14-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 14-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 96.5 | | % | | 80-120 | 12-MAY-19 |
| Antimony (Sb)-Total | | | 94.5 | | % | | 80-120 | 12-MAY-19 |
| Arsenic (As)-Total | | | 96.0 | | % | | 80-120 | 12-MAY-19 |
| Barium (Ba)-Total | | | 98.2 | | % | | 80-120 | 12-MAY-19 |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 | LCS | | | | | | | |
| Bismuth (Bi)-Total | | | 90.2 | | % | | 80-120 | 12-MAY-19 |
| Boron (B)-Total | | | 87.5 | | % | | 80-120 | 12-MAY-19 |
| Cadmium (Cd)-Total | | | 96.4 | | % | | 80-120 | 12-MAY-19 |
| Calcium (Ca)-Total | | | 90.3 | | % | | 80-120 | 12-MAY-19 |
| Chromium (Cr)-Total | | | 95.0 | | % | | 80-120 | 12-MAY-19 |
| Cobalt (Co)-Total | | | 95.6 | | % | | 80-120 | 12-MAY-19 |
| Copper (Cu)-Total | | | 94.2 | | % | | 80-120 | 12-MAY-19 |
| Iron (Fe)-Total | | | 96.6 | | % | | 80-120 | 12-MAY-19 |
| Lead (Pb)-Total | | | 90.7 | | % | | 80-120 | 12-MAY-19 |
| Lithium (Li)-Total | | | 87.4 | | % | | 80-120 | 12-MAY-19 |
| Magnesium (Mg)-Total | | | 97.0 | | % | | 80-120 | 12-MAY-19 |
| Manganese (Mn)-Total | | | 98.3 | | % | | 80-120 | 12-MAY-19 |
| Molybdenum (Mo)-Total | | | 93.2 | | % | | 80-120 | 12-MAY-19 |
| Nickel (Ni)-Total | | | 95.1 | | % | | 80-120 | 12-MAY-19 |
| Potassium (K)-Total | | | 95.7 | | % | | 80-120 | 12-MAY-19 |
| Selenium (Se)-Total | | | 97.3 | | % | | 80-120 | 12-MAY-19 |
| Silicon (Si)-Total | | | 97.7 | | % | | 80-120 | 12-MAY-19 |
| Silver (Ag)-Total | | | 91.8 | | % | | 80-120 | 12-MAY-19 |
| Sodium (Na)-Total | | | 99.1 | | % | | 80-120 | 12-MAY-19 |
| Strontium (Sr)-Total | | | 95.9 | | % | | 80-120 | 12-MAY-19 |
| Thallium (Tl)-Total | | | 93.5 | | % | | 80-120 | 12-MAY-19 |
| Tin (Sn)-Total | | | 95.7 | | % | | 80-120 | 12-MAY-19 |
| Titanium (Ti)-Total | | | 99.5 | | % | | 80-120 | 12-MAY-19 |
| Uranium (U)-Total | | | 93.7 | | % | | 80-120 | 12-MAY-19 |
| Vanadium (V)-Total | | | 96.7 | | % | | 80-120 | 12-MAY-19 |
| Zinc (Zn)-Total | | | 89.3 | | % | | 80-120 | 12-MAY-19 |
| WG3047525-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 12-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 12-MAY-19 |
| Cadmium (Cd)-Total | | | <0.000005C | | mg/L | | 0.000005 | 12-MAY-19 |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-1 | MB | | | | | | | |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 12-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 12-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 12-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 12-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 12-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 12-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 12-MAY-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4636648 | | | | | | | |
| WG3051821-6 | LCS | | | | | | | |
| Ammonia as N | | | 88.4 | | % | | 85-115 | 16-MAY-19 |
| WG3051821-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 16-MAY-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Nitrite (as N) | | | 109.3 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 10-MAY-19 |



Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|----------|--------------|--------|-----------|-------|-----|--------|-----------|
| SOLIDS-TDS-CL | | Water | | | | | | |
| Batch | R4636681 | | | | | | | |
| WG3050344-4 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 15-MAY-19 |
| TKN-L-F-CL | | Water | | | | | | |
| Batch | R4637012 | | | | | | | |
| WG3052313-10 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.6 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-14 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-18 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-2 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 97.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-6 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.4 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-1 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-13 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-17 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-5 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-9 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| TSS-L-CL | | Water | | | | | | |
| Batch | R4636615 | | | | | | | |
| WG3050221-6 LCS | | | | | | | | |
| Total Suspended Solids | | | 94.9 | | % | | 85-115 | 15-MAY-19 |
| WG3050221-5 MB | | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 15-MAY-19 |
| TURBIDITY-CL | | Water | | | | | | |
| Batch | R4637597 | | | | | | | |
| WG3047499-2 LCS | | | | | | | | |
| Turbidity | | | 97.0 | | % | | 85-115 | 11-MAY-19 |
| WG3047499-1 MB | | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 11-MAY-19 |

Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Quality Control Report

Workorder: L2271140

Report Date: 17-MAY-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | 1 | 08-MAY-19 17:02 | 14-MAY-19 15:30 | 0.25 | 143 | hours | EHTR-FM |
| Total Suspended Solids | 1 | 08-MAY-19 17:02 | 16-MAY-19 09:00 | 7 | 8 | days | EHT |
| pH | 1 | 08-MAY-19 17:02 | 15-MAY-19 09:00 | 0.25 | 160 | hours | EHTR-FM |

Legend & Qualifier Definitions:

| | |
|----------|---|
| EHTR-FM: | Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended. |
| EHTR: | Exceeded ALS recommended hold time prior to sample receipt. |
| EHTL: | Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry. |
| EHT: | Exceeded ALS recommended hold time prior to analysis. |
| Rec. HT: | ALS recommended hold time (see units). |

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2271140 were received on 10-MAY-19 09:10.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

COC ID:

REP-Lentic 19-12 - 2

TURNAROUND TIME:

| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
|----------------------|--------------------------------|----------|--------|--------------|-------------------------------|----------|--------|
| Facility Name / Job# | Regional Effects Program (REP) | | | Lab Name | ALS Calgary | | |
| Project Manager | Cait Good | | | Lab Contact | Lyudmyla Shvets | | |
| Email | cait.good@teck.com | | | Email | lyudmyla.shvets@alsglobal.com | | |
| Address | 421 Pine Avenue | | | Address | 2559 29 Street NE | | |
| City | Sparwood | Province | BC | City | Calgary | Province | AB |
| Postal Code | V0B 2G8 | Country | Canada | Postal Code | T1Y 7B5 | Country | Canada |
| Phone Number | 250-425-8202 | | | Phone Number | 1 403 407 1794 | | |

SAMPLE DETAILS

ANALYSIS REQUESTED

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | ANALYSIS REQUESTED | | | | | | | |
|--------------------------------|-----------------|--------------|-----------------------------|----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|--|
| | | | | | | | | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | |
| RG_LNLK_WS_20190508-1702 | RG_LNLK | WS | No | 8-May-19 | 1702 | G | 7 | X | X | X | X | X | X | | |
| RG_LNLK_WS_20190508-1702 FB-HG | RG_LNLK | WS | No | 8-May-19 | 1702 | G | 1 | | | | X | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | |

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION

DATE/TIME

ACCEPTED BY/AFFILIATION

For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample?

Handwritten: [Signature] 5/10 9:10

NB OF BOTTLES RETURNED/DESCRIPTION

| | | |
|---|---------------------|-----------|
| Regular (default) s | Sampler's Name | Mobile # |
| Priority (2-3 business days) - 50% surcharge | Sampler's Signature | Date/Time |
| Emergency (1 Business Day) - 100% surcharge | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | |

Handwritten: 7



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 10-MAY-19
Report Date: 17-MAY-19 17:02 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2271157
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-12 - 2
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2271157-1 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 | L2271157-2 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 FB-HG | | |
|-----------------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 160 | | | |
| | Hardness (as CaCO3) (mg/L) | 79.7 | | | |
| | pH (pH) | 8.09 | | | |
| | ORP (mV) | 407 | | | |
| | Total Suspended Solids (mg/L) | 11.0 | | | |
| | Total Dissolved Solids (mg/L) | 109 ^{DLHC} | | | |
| | Turbidity (NTU) | 10.6 | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | 3.3 | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 82.2 | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | 82.2 | | | |
| | Ammonia as N (mg/L) | <0.0050 | | | |
| | Bromide (Br) (mg/L) | <0.050 | | | |
| | Chloride (Cl) (mg/L) | <0.50 | | | |
| | Fluoride (F) (mg/L) | 0.041 | | | |
| | Ion Balance (%) | 100 | | | |
| | Nitrate (as N) (mg/L) | <0.0050 | | | |
| | Nitrite (as N) (mg/L) | <0.0010 | | | |
| | Total Kjeldahl Nitrogen (mg/L) | 0.132 | | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0124 | | | |
| | Sulfate (SO4) (mg/L) | 1.25 | | | |
| | Anion Sum (meq/L) | 1.67 | | | |
| | Cation Sum (meq/L) | 1.67 | | | |
| | Cation - Anion Balance (%) | 0.0 | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 2.85 | | | |
| | Total Organic Carbon (mg/L) | 2.89 | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.201 | | | |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | | | |
| | Arsenic (As)-Total (mg/L) | 0.00022 | | | |
| | Barium (Ba)-Total (mg/L) | 0.0554 | | | |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | | |
| | Boron (B)-Total (mg/L) | <0.010 | | | |
| | Cadmium (Cd)-Total (ug/L) | <0.0050 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2271157-1 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 | L2271157-2 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 FB-HG | | |
|-------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | 20.9 | | | |
| | Chromium (Cr)-Total (mg/L) | 0.00030 | | | |
| | Cobalt (Co)-Total (ug/L) | 0.14 | | | |
| | Copper (Cu)-Total (mg/L) | 0.00056 | | | |
| | Iron (Fe)-Total (mg/L) | 0.254 | | | |
| | Lead (Pb)-Total (mg/L) | 0.000134 | | | |
| | Lithium (Li)-Total (mg/L) | <0.0010 | | | |
| | Magnesium (Mg)-Total (mg/L) | 7.25 | | | |
| | Manganese (Mn)-Total (mg/L) | 0.00940 | | | |
| | Mercury (Hg)-Total (ug/L) | 0.00168 | <0.00050 | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.000089 | | | |
| | Nickel (Ni)-Total (mg/L) | <0.00050 | | | |
| | Potassium (K)-Total (mg/L) | 0.600 | | | |
| | Selenium (Se)-Total (ug/L) | <0.050 | | | |
| | Silicon (Si)-Total (mg/L) | 4.93 | | | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | 1.47 | | | |
| | Strontium (Sr)-Total (mg/L) | 0.0312 | | | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | 0.000308 | | | |
| | Vanadium (V)-Total (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | | | |
| | Dissolved Metals Filtration Location | LAB | | | |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0118 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00015 | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.0488 | | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | <0.010 | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | <0.0050 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 21.0 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2271157-1 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 | L2271157-2 WS 07-MAY-19 15:15 RG_GC_WS_2019 0507-1515 FB-HG | | |
|-------------------------|--|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | 0.011 | | | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | <0.0010 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 6.61 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00053 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000080 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.565 | | | |
| | Selenium (Se)-Dissolved (ug/L) | <0.050 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 4.47 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | 1.46 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.0284 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.000331 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2271157-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2271157-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2271157-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2271157-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2271157-1 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2271157-1 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2271157-1 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2271157-1 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2271157-1 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved. | | | |
| C-TOT-ORG-LOW-CL | Water | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by | | | |

Reference Information

subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

Reference Information

| | | | |
|---|-------|---------------------------------|--------------------------|
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-12 - 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2271157

Report Date: 17-MAY-19

Page 1 of 10

Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0
 Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636618 | | | | | | | |
| WG3051277-12 DUP | | L2271157-1 | | | | | | |
| Acidity (as CaCO3) | | 3.3 | 3.4 | | mg/L | 2.4 | 20 | 15-MAY-19 |
| WG3051277-11 LCS | | | | | | | | |
| Acidity (as CaCO3) | | | 104.7 | | % | | 85-115 | 15-MAY-19 |
| WG3051277-10 MB | | | | | | | | |
| Acidity (as CaCO3) | | | 1.4 | | mg/L | | 2 | 15-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636590 | | | | | | | |
| WG3051280-11 LCS | | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 97.4 | | % | | 85-115 | 15-MAY-19 |
| WG3051280-10 MB | | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 15-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-2 LCS | | | | | | | | |
| Beryllium (Be)-Dissolved | | | 99.8 | | % | | 80-120 | 14-MAY-19 |
| WG3048893-1 MB | | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 14-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 LCS | | | | | | | | |
| Beryllium (Be)-Total | | | 88.4 | | % | | 80-120 | 12-MAY-19 |
| WG3047525-1 MB | | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 12-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 LCS | | | | | | | | |
| Bromide (Br) | | | 104.0 | | % | | 85-115 | 10-MAY-19 |
| WG3047327-9 MB | | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 10-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637537 | | | | | | | |
| WG3052922-6 LCS | | | | | | | | |
| Dissolved Organic Carbon | | | 100.9 | | % | | 80-120 | 17-MAY-19 |
| WG3052922-5 MB | | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 17-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2271157

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|--------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| C-TOT-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4637537 | | | | | | | |
| WG3052922-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 108.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052922-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 17-MAY-19 |
| CL-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Chloride (Cl) | | | 102.5 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 10-MAY-19 |
| EC-L-PCT-CL | Water | | | | | | | |
| Batch | R4636590 | | | | | | | |
| WG3051280-11 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 105.2 | | % | | 90-110 | 15-MAY-19 |
| WG3051280-10 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 15-MAY-19 |
| F-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Fluoride (F) | | | 107.6 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 10-MAY-19 |
| HG-D-CVAA-VA | Water | | | | | | | |
| Batch | R4635213 | | | | | | | |
| WG3049627-6 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 102.6 | | % | | 80-120 | 15-MAY-19 |
| WG3049627-5 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 15-MAY-19 |
| HG-T-U-CVAF-VA | Water | | | | | | | |
| Batch | R4637338 | | | | | | | |
| WG3052736-6 | DUP | L2271157-1 | | | | | | |
| Mercury (Hg)-Total | | 0.00168 | 0.00186 | | ug/L | 10 | 20 | 17-MAY-19 |
| WG3052736-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 115.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052736-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 17-MAY-19 |
| MET-D-CCMS-VA | Water | | | | | | | |



Quality Control Report

Workorder: L2271157

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 101.4 | | % | | 80-120 | 14-MAY-19 |
| Antimony (Sb)-Dissolved | | | 100.1 | | % | | 80-120 | 14-MAY-19 |
| Arsenic (As)-Dissolved | | | 94.9 | | % | | 80-120 | 14-MAY-19 |
| Barium (Ba)-Dissolved | | | 89.7 | | % | | 80-120 | 14-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 98.0 | | % | | 80-120 | 14-MAY-19 |
| Boron (B)-Dissolved | | | 97.1 | | % | | 80-120 | 14-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 92.9 | | % | | 80-120 | 14-MAY-19 |
| Calcium (Ca)-Dissolved | | | 99.2 | | % | | 80-120 | 14-MAY-19 |
| Chromium (Cr)-Dissolved | | | 98.7 | | % | | 80-120 | 14-MAY-19 |
| Cobalt (Co)-Dissolved | | | 94.1 | | % | | 80-120 | 14-MAY-19 |
| Copper (Cu)-Dissolved | | | 95.8 | | % | | 80-120 | 14-MAY-19 |
| Iron (Fe)-Dissolved | | | 95.4 | | % | | 80-120 | 14-MAY-19 |
| Lead (Pb)-Dissolved | | | 96.9 | | % | | 80-120 | 14-MAY-19 |
| Lithium (Li)-Dissolved | | | 102.3 | | % | | 80-120 | 14-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 107.3 | | % | | 80-120 | 14-MAY-19 |
| Manganese (Mn)-Dissolved | | | 98.7 | | % | | 80-120 | 14-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 97.3 | | % | | 80-120 | 14-MAY-19 |
| Nickel (Ni)-Dissolved | | | 97.6 | | % | | 80-120 | 14-MAY-19 |
| Potassium (K)-Dissolved | | | 105.7 | | % | | 80-120 | 14-MAY-19 |
| Selenium (Se)-Dissolved | | | 93.9 | | % | | 80-120 | 14-MAY-19 |
| Silicon (Si)-Dissolved | | | 102.3 | | % | | 60-140 | 14-MAY-19 |
| Silver (Ag)-Dissolved | | | 93.4 | | % | | 80-120 | 14-MAY-19 |
| Sodium (Na)-Dissolved | | | 99.9 | | % | | 80-120 | 14-MAY-19 |
| Strontium (Sr)-Dissolved | | | 96.8 | | % | | 80-120 | 14-MAY-19 |
| Thallium (Tl)-Dissolved | | | 96.5 | | % | | 80-120 | 14-MAY-19 |
| Tin (Sn)-Dissolved | | | 93.1 | | % | | 80-120 | 14-MAY-19 |
| Titanium (Ti)-Dissolved | | | 96.9 | | % | | 80-120 | 14-MAY-19 |
| Uranium (U)-Dissolved | | | 99.8 | | % | | 80-120 | 14-MAY-19 |
| Vanadium (V)-Dissolved | | | 100.8 | | % | | 80-120 | 14-MAY-19 |
| Zinc (Zn)-Dissolved | | | 95.1 | | % | | 80-120 | 14-MAY-19 |
| WG3048893-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |



Quality Control Report

Workorder: L2271157

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4634858 | | | | | | | |
| WG3048893-1 | MB | LF | | | | | | |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 14-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 14-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 14-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 14-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 14-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 14-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 14-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 14-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 14-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 96.5 | | % | | 80-120 | 12-MAY-19 |
| Antimony (Sb)-Total | | | 94.5 | | % | | 80-120 | 12-MAY-19 |
| Arsenic (As)-Total | | | 96.0 | | % | | 80-120 | 12-MAY-19 |
| Barium (Ba)-Total | | | 98.2 | | % | | 80-120 | 12-MAY-19 |



Quality Control Report

Workorder: L2271157

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-2 | LCS | | | | | | | |
| Bismuth (Bi)-Total | | | 90.2 | | % | | 80-120 | 12-MAY-19 |
| Boron (B)-Total | | | 87.5 | | % | | 80-120 | 12-MAY-19 |
| Cadmium (Cd)-Total | | | 96.4 | | % | | 80-120 | 12-MAY-19 |
| Calcium (Ca)-Total | | | 90.3 | | % | | 80-120 | 12-MAY-19 |
| Chromium (Cr)-Total | | | 95.0 | | % | | 80-120 | 12-MAY-19 |
| Cobalt (Co)-Total | | | 95.6 | | % | | 80-120 | 12-MAY-19 |
| Copper (Cu)-Total | | | 94.2 | | % | | 80-120 | 12-MAY-19 |
| Iron (Fe)-Total | | | 96.6 | | % | | 80-120 | 12-MAY-19 |
| Lead (Pb)-Total | | | 90.7 | | % | | 80-120 | 12-MAY-19 |
| Lithium (Li)-Total | | | 87.4 | | % | | 80-120 | 12-MAY-19 |
| Magnesium (Mg)-Total | | | 97.0 | | % | | 80-120 | 12-MAY-19 |
| Manganese (Mn)-Total | | | 98.3 | | % | | 80-120 | 12-MAY-19 |
| Molybdenum (Mo)-Total | | | 93.2 | | % | | 80-120 | 12-MAY-19 |
| Nickel (Ni)-Total | | | 95.1 | | % | | 80-120 | 12-MAY-19 |
| Potassium (K)-Total | | | 95.7 | | % | | 80-120 | 12-MAY-19 |
| Selenium (Se)-Total | | | 97.3 | | % | | 80-120 | 12-MAY-19 |
| Silicon (Si)-Total | | | 97.7 | | % | | 80-120 | 12-MAY-19 |
| Silver (Ag)-Total | | | 91.8 | | % | | 80-120 | 12-MAY-19 |
| Sodium (Na)-Total | | | 99.1 | | % | | 80-120 | 12-MAY-19 |
| Strontium (Sr)-Total | | | 95.9 | | % | | 80-120 | 12-MAY-19 |
| Thallium (Tl)-Total | | | 93.5 | | % | | 80-120 | 12-MAY-19 |
| Tin (Sn)-Total | | | 95.7 | | % | | 80-120 | 12-MAY-19 |
| Titanium (Ti)-Total | | | 99.5 | | % | | 80-120 | 12-MAY-19 |
| Uranium (U)-Total | | | 93.7 | | % | | 80-120 | 12-MAY-19 |
| Vanadium (V)-Total | | | 96.7 | | % | | 80-120 | 12-MAY-19 |
| Zinc (Zn)-Total | | | 89.3 | | % | | 80-120 | 12-MAY-19 |
| WG3047525-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 12-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 12-MAY-19 |
| Cadmium (Cd)-Total | | | <0.000005C | | mg/L | | 0.000005 | 12-MAY-19 |



Quality Control Report

Workorder: L2271157

Report Date: 17-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4632066 | | | | | | | |
| WG3047525-1 | MB | | | | | | | |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 12-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 12-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 12-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 12-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 12-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 12-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 12-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 12-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 12-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 12-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 12-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 12-MAY-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4636648 | | | | | | | |
| WG3051821-6 | LCS | | | | | | | |
| Ammonia as N | | | 88.4 | | % | | 85-115 | 16-MAY-19 |
| WG3051821-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 16-MAY-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Nitrite (as N) | | | 109.3 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 10-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------------|---------------|---------|-----------|-------|-----|---------|-----------|
| NO3-L-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Nitrate (as N) | | | 103.6 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 10-MAY-19 |
| ORP-CL | Water | | | | | | | |
| Batch | R4635113 | | | | | | | |
| WG3050043-7 | CRM | CL-ORP | | | | | | |
| ORP | | | 223 | | mV | | 210-230 | 14-MAY-19 |
| P-T-L-COL-CL | Water | | | | | | | |
| Batch | R4636502 | | | | | | | |
| WG3051587-34 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 101.4 | | % | | 80-120 | 16-MAY-19 |
| WG3051587-33 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 16-MAY-19 |
| PH-CL | Water | | | | | | | |
| Batch | R4636590 | | | | | | | |
| WG3051280-11 | LCS | | | | | | | |
| pH | | | 6.99 | | pH | | 6.9-7.1 | 15-MAY-19 |
| PO4-DO-L-COL-CL | Water | | | | | | | |
| Batch | R4630905 | | | | | | | |
| WG3046912-6 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 100.5 | | % | | 80-120 | 10-MAY-19 |
| WG3046912-5 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 10-MAY-19 |
| SO4-IC-N-CL | Water | | | | | | | |
| Batch | R4631153 | | | | | | | |
| WG3047327-10 | LCS | | | | | | | |
| Sulfate (SO4) | | | 102.6 | | % | | 90-110 | 10-MAY-19 |
| WG3047327-9 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 10-MAY-19 |
| SOLIDS-TDS-CL | Water | | | | | | | |
| Batch | R4634892 | | | | | | | |
| WG3047948-14 | LCS | | | | | | | |
| Total Dissolved Solids | | | 95.5 | | % | | 85-115 | 13-MAY-19 |
| WG3047948-13 | MB | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|----------|--------------|--------|-----------|-------|-----|--------|-----------|
| SOLIDS-TDS-CL | | Water | | | | | | |
| Batch | R4634892 | | | | | | | |
| WG3047948-13 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 13-MAY-19 |
| TKN-L-F-CL | | Water | | | | | | |
| Batch | R4637012 | | | | | | | |
| WG3052313-10 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.6 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-14 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-18 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-2 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 97.2 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-6 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 95.4 | | % | | 75-125 | 16-MAY-19 |
| WG3052313-1 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-13 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-17 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-5 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| WG3052313-9 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 16-MAY-19 |
| TSS-L-CL | | Water | | | | | | |
| Batch | R4634811 | | | | | | | |
| WG3048017-25 LCS | | | | | | | | |
| Total Suspended Solids | | | 92.9 | | % | | 85-115 | 13-MAY-19 |
| WG3048017-24 MB | | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 13-MAY-19 |
| TURBIDITY-CL | | Water | | | | | | |
| Batch | R4637597 | | | | | | | |
| WG3047499-2 LCS | | | | | | | | |
| Turbidity | | | 97.0 | | % | | 85-115 | 11-MAY-19 |
| WG3047499-1 MB | | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 11-MAY-19 |

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | 1 | 07-MAY-19 15:15 | 14-MAY-19 16:05 | 0.25 | 169 | hours | EHTR-FM |
| Turbidity | 1 | 07-MAY-19 15:15 | 11-MAY-19 09:00 | 3 | 4 | days | EHTL |
| pH | 1 | 07-MAY-19 15:15 | 15-MAY-19 09:00 | 0.25 | 186 | hours | EHTR-FM |

Legend & Qualifier Definitions:

| | |
|----------|---|
| EHTR-FM: | Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended. |
| EHTR: | Exceeded ALS recommended hold time prior to sample receipt. |
| EHTL: | Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry. |
| EHT: | Exceeded ALS recommended hold time prior to analysis. |
| Rec. HT: | ALS recommended hold time (see units). |

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2271157 were received on 10-MAY-19 09:10.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

| | | | |
|---|----------------|-------------------------------------|----------------|
| COC ID: REP-Lentic 19-12 - 2 | | TURNAROUND TIME: | |
| PROJECT/CLIENT INFO | | | |
| Facility Name / Job# Regional Effects Program (REP) | | Lab Name ALS Calgary | |
| Project Manager Cait Good | | Lab Contact Lyudmyla Shvets | |
| Email cait.good@teck.com | | Email lyudmyla.shvets@atsglobal.com | |
| Address 421 Pine Avenue | | Address 2559 29 Street NE | |
| City Sparwood | Province BC | City Calgary | Province AB |
| Postal Code V0B 2G0 | Country Canada | Postal Code T1Y 7B5 | Country Canada |
| Phone Number 250-425-8202 | | Phone Number 1 403 407 1794 | |

| LABORATORY | Excel | PDF | EDD |
|----------------------|-------|-----|-----|
| cait.good@teck.com | X | X | X |
| teck@teckonline.com | X | X | X |
| caite.hoyor@teck.com | X | X | X |

SAMPLE DETAILS Filtered - By: Method, Lab, Field & Lab, Job Name

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | ANALYSIS REQUESTED | | | | | | | | | | | |
|------------------------------|-----------------|--------------|-----------------------------|----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|--|--|--|--|--|
| | | | | | | | | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-D-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | | | | | |
| RG_GC_WS_20190507-1515 | RG_GC | WS | No | 7-May-19 | 1515 | G | 7 | X | X | X | X | X | X | | | | | | |
| RG_GC_WS_20190507-1515 FB-HG | RG_GC | WS | No | 7-May-19 | 1515 | G | 1 | | | | X | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |
| | | | No | | | | | | | | | | | | | | | | |

| | | | | |
|---|---------------------|-----------------------------|-----------|-------------------------|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | | RELINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
| For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample? | | | | <i>[Signature]</i> |
| NB OF BOTTLES RETURNED/DESCRIPTION | | | | 5/10 9/10 |
| Regular (default) x | Sampler's Name | | Mobile # | |
| Priority (2-3 business days) - 50% surcharge | Sampler's Signature | | Date/Time | |
| Emergency (1 Business Day) - 100% surcharge | | | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | | | 7 |



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 14-MAY-19
Report Date: 22-MAY-19 17:14 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2272864
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM (REP)
C of C Numbers: REP-Lentic 19-12 - 2
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-1 | L2272864-2 | L2272864-3 | L2272864-4 | L2272864-5 |
|-----------------------------|---|---------------------------------|------------------------------|--|--------------------------------|------------------------------|--|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | Sampled Time | 08:51 | 08:51 | 08:51 | 09:32 | 09:32 |
| | | Client ID | RG_GO13_WS_20 190513-0851 | RG_GO13_WS_20 190513-0851 FB- HG | RG_FBLANK_WS_ 20190513-0851 | RG_STPD_WS_20 190513-0932 | RG_STPD_WS_20 190513-0932 FB- HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 1020 | | <2.0 | 387 | |
| | Hardness (as CaCO3) (mg/L) | | 592 | | <0.50 | 213 | |
| | pH (pH) | | 8.18 | | 6.01 | 8.18 | |
| | ORP (mV) | | 453 | | 471 | 440 | |
| | Total Suspended Solids (mg/L) | | 23.8 | | <1.0 | 1.6 | |
| | Total Dissolved Solids (mg/L) | | 711 | DLHC | <10 | 235 | DLHC |
| | Turbidity (NTU) | | 18.9 | | <0.10 | 1.14 | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 4.8 | | 1.4 | 2.3 | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 220 | | <1.0 | 140 | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | | <1.0 | <1.0 | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | <1.0 | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 220 | | <1.0 | 140 | |
| | Ammonia as N (mg/L) | | 0.0087 | | <0.0050 | <0.0050 | |
| | Bromide (Br) (mg/L) | | <0.25 | DLHC | <0.050 | <0.050 | |
| | Chloride (Cl) (mg/L) | | 24.7 | DLHC | <0.50 | 6.82 | |
| | Fluoride (F) (mg/L) | | 0.17 | DLHC | <0.020 | 0.132 | |
| | Ion Balance (%) | | 100 | | 0.0 | 107 | |
| | Nitrate (as N) (mg/L) | | 0.955 | DLHC | <0.0050 | 0.134 | |
| | Nitrite (as N) (mg/L) | | <0.0050 | DLHC | <0.0010 | 0.0058 | |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.317 | | <0.050 | 0.160 | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | <0.0010 | <0.0010 | |
| | Phosphorus (P)-Total (mg/L) | | 0.0208 | | <0.0020 | 0.0108 | |
| | Sulfate (SO4) (mg/L) | | 338 | DLHC | <0.30 | 57.0 | |
| | Anion Sum (meq/L) | | 12.2 | | <0.10 | 4.19 | |
| | Cation Sum (meq/L) | | 12.2 | | <0.10 | 4.50 | |
| | Cation - Anion Balance (%) | | 0.1 | | 0.0 | 3.5 | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 0.91 | | <0.50 | 1.38 |
| Total Organic Carbon (mg/L) | | | 1.51 | | <0.50 | 1.76 | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.255 | | <0.0030 | 0.0167 | |
| | Antimony (Sb)-Total (mg/L) | | 0.00045 | | <0.00010 | 0.00015 | |
| | Arsenic (As)-Total (mg/L) | | 0.00024 | | <0.00010 | 0.00020 | |
| | Barium (Ba)-Total (mg/L) | | 0.0883 | | <0.00010 | 0.0870 | |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | <0.020 | |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | <0.000050 | |
| | Boron (B)-Total (mg/L) | | 0.023 | | <0.010 | <0.010 | |
| | Cadmium (Cd)-Total (ug/L) | | 0.0257 | | <0.0050 | 0.0061 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | | L2272864-6 WS 13-MAY-19 10:17 RG_ER_WS_2019 0513-1017 | L2272864-7 WS 13-MAY-19 10:17 RG_ER_WS_2019 0513-1017 FB-HG | L2272864-8 WS 13-MAY-19 13:07 RG_GC_WS_2019 0513-1307 | L2272864-9 WS 13-MAY-19 13:07 RG_GC_WS_2019 0513-1307 FB-HG | L2272864-10 WS 13-MAY-19 13:56 RG_EROL_WS_20 190513-1356 |
|---|---|--|--|--|--|---|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 242 | | 250 | | 420 |
| | Hardness (as CaCO3) (mg/L) | 124 | | 128 | | 234 |
| | pH (pH) | 8.09 | | 8.12 | | 8.16 |
| | ORP (mV) | 415 | | 404 | | 432 |
| | Total Suspended Solids (mg/L) | 12.6 | | 6.8 | | 1.1 |
| | Total Dissolved Solids (mg/L) | 148 | DLHC | 148 | DLHC | 230 |
| | Turbidity (NTU) | 7.87 | | 3.54 | | 0.44 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | 2.3 | | <1.0 | | 4.6 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 97.9 | | 110 | | 196 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | 97.9 | | 110 | | 196 |
| | Ammonia as N (mg/L) | <0.0050 | | 0.0149 | | <0.0050 |
| | Bromide (Br) (mg/L) | <0.050 | | <0.050 | | <0.050 |
| | Chloride (Cl) (mg/L) | 3.22 | | 2.45 | | 4.27 |
| | Fluoride (F) (mg/L) | 0.079 | | 0.074 | | 0.125 |
| | Ion Balance (%) | 103 | | 101 | | 105 |
| | Nitrate (as N) (mg/L) | 0.150 | | 0.143 | | 0.291 |
| | Nitrite (as N) (mg/L) | 0.0012 | | 0.0014 | | 0.0016 |
| | Total Kjeldahl Nitrogen (mg/L) | 0.103 | | 0.130 | | 0.093 |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | 0.0022 | | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | 0.0090 | | 0.0084 | | 0.0034 |
| | Sulfate (SO4) (mg/L) | 25.8 | | 20.1 | | 28.0 |
| | Anion Sum (meq/L) | 2.60 | | 2.71 | | 4.65 |
| | Cation Sum (meq/L) | 2.67 | | 2.74 | | 4.86 |
| | Cation - Anion Balance (%) | 1.3 | | 0.6 | | 2.2 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 1.33 | | 1.59 | |
| Total Organic Carbon (mg/L) | | 1.51 | | 1.74 | | 0.77 |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0975 | | 0.0570 | | 0.0110 |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Total (mg/L) | 0.00044 | | 0.00038 | | 0.00014 |
| | Barium (Ba)-Total (mg/L) | 0.0347 | | 0.0465 | | 0.106 |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Total (mg/L) | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | 0.0091 | | 0.0060 | | 0.0112 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | | L2272864-11 WS 13-MAY-19 13:56 RG_EROL_WS_20 190513-1356 FB- HG | L2272864-12 WS 13-MAY-19 13:56 RG_DUP_WS_201 90513-1356 | L2272864-13 WS 13-MAY-19 13:56 RG_DUP_WS_201 90513-1356 FB-HG | L2272864-14 WS 13-MAY-19 12:00 RG_TRIP_WS_201 90513-0000 | L2272864-15 WS 13-MAY-19 15:00 RG_ELWDGC_WS _20190513-1500 |
|---|---|---|--|--|---|---|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 419 | | <2.0 | 516 |
| | Hardness (as CaCO3) (mg/L) | | 228 | | <0.50 | 284 |
| | pH (pH) | | 8.15 | | 5.43 | 8.18 |
| | ORP (mV) | | 408 | | 465 | 422 |
| | Total Suspended Solids (mg/L) | | <1.0 | | <1.0 | 2.5 |
| | Total Dissolved Solids (mg/L) | | 236 | DLHC | <10 | 317 |
| | Turbidity (NTU) | | 0.64 | | <0.10 | 0.64 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 5.4 | | 1.3 | 3.9 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 194 | | <1.0 | 165 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | | <1.0 | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 194 | | <1.0 | 165 |
| | Ammonia as N (mg/L) | | <0.0050 | | 0.0511 | <0.0050 |
| | Bromide (Br) (mg/L) | | <0.050 | | <0.050 | <0.050 |
| | Chloride (Cl) (mg/L) | | 4.28 | | <0.50 | 2.82 |
| | Fluoride (F) (mg/L) | | 0.125 | | <0.020 | 0.205 |
| | Ion Balance (%) | | 103 | | 0.0 | 102 |
| | Nitrate (as N) (mg/L) | | 0.290 | | <0.0050 | 3.18 |
| | Nitrite (as N) (mg/L) | | 0.0016 | | <0.0010 | 0.0034 |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.079 | | | 0.423 |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | <0.0010 | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | | 0.0046 | | <0.0020 | 0.0164 |
| | Sulfate (SO4) (mg/L) | | 28.0 | | <0.30 | 99.3 |
| | Anion Sum (meq/L) | | 4.61 | | <0.10 | 5.68 |
| | Cation Sum (meq/L) | | 4.73 | | <0.10 | 5.81 |
| | Cation - Anion Balance (%) | | 1.3 | | 0.0 | 1.2 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 0.60 | | |
| Total Organic Carbon (mg/L) | | | 0.87 | | | <0.50 |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0081 | | <0.0030 | 0.0708 |
| | Antimony (Sb)-Total (mg/L) | | <0.00010 | | <0.00010 | <0.00010 |
| | Arsenic (As)-Total (mg/L) | | 0.00012 | | <0.00010 | 0.00016 |
| | Barium (Ba)-Total (mg/L) | | 0.105 | | <0.00010 | 0.0686 |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | <0.000050 |
| | Boron (B)-Total (mg/L) | | <0.010 | | <0.010 | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | | 0.0125 | | <0.0050 | 0.0195 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | L2272864-16 WS 13-MAY-19 15:00 RG_ELWDGC_WS _20190513-1500 FB-HG | L2272864-17 WS 13-MAY-19 08:44 RG_ERIMF_WS_2 0190513-0844 | L2272864-18 WS 13-MAY-19 08:44 RG_ERIMF_WS_2 0190513-0844 FB- HG | | |
|---|--|--|--|------|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 392 | | |
| | Hardness (as CaCO3) (mg/L) | | 197 | | |
| | pH (pH) | | 8.21 | | |
| | ORP (mV) | | 445 | | |
| | Total Suspended Solids (mg/L) | | 2.6 | | |
| | Total Dissolved Solids (mg/L) | | 213 | DLHC | |
| | Turbidity (NTU) | | 1.92 | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 4.0 | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 185 | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 185 | | |
| | Ammonia as N (mg/L) | | <0.0050 | | |
| | Bromide (Br) (mg/L) | | <0.050 | | |
| | Chloride (Cl) (mg/L) | | 12.2 | | |
| | Fluoride (F) (mg/L) | | 0.091 | | |
| | Ion Balance (%) | | 104 | | |
| | Nitrate (as N) (mg/L) | | <0.0050 | | |
| | Nitrite (as N) (mg/L) | | <0.0010 | | |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.260 | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | |
| | Phosphorus (P)-Total (mg/L) | | 0.0172 | | |
| | Sulfate (SO4) (mg/L) | | 7.11 | | |
| | Anion Sum (meq/L) | | 4.20 | | |
| | Cation Sum (meq/L) | | 4.35 | | |
| | Cation - Anion Balance (%) | | 1.8 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 1.66 | | |
| | Total Organic Carbon (mg/L) | | 1.84 | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0178 | | |
| | Antimony (Sb)-Total (mg/L) | | 0.00020 | | |
| | Arsenic (As)-Total (mg/L) | | 0.00038 | | |
| | Barium (Ba)-Total (mg/L) | | 0.146 | | |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | |
| | Boron (B)-Total (mg/L) | | <0.010 | | |
| | Cadmium (Cd)-Total (ug/L) | | 0.0090 | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-1 | L2272864-2 | L2272864-3 | L2272864-4 | L2272864-5 |
|-------------------------|---------------------------------------|--------------|------------------------------|--|--------------------------------|------------------------------|--|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | Sampled Time | 08:51 | 08:51 | 08:51 | 09:32 | 09:32 |
| | | Client ID | RG_GO13_WS_20 190513-0851 | RG_GO13_WS_20 190513-0851 FB- HG | RG_FBLANK_WS_ 20190513-0851 | RG_STPD_WS_20 190513-0932 | RG_STPD_WS_20 190513-0932 FB- HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 119 | | <0.050 | 51.8 | |
| | Chromium (Cr)-Total (mg/L) | | 0.00039 | | <0.00010 | 0.00015 | |
| | Cobalt (Co)-Total (ug/L) | | 0.19 | | <0.10 | <0.10 | |
| | Copper (Cu)-Total (mg/L) | | 0.00061 | | <0.00050 | <0.00050 | |
| | Iron (Fe)-Total (mg/L) | | 0.232 | | <0.010 | 0.047 | |
| | Lead (Pb)-Total (mg/L) | | 0.000190 | | <0.000050 | <0.000050 | |
| | Lithium (Li)-Total (mg/L) | | 0.0280 | | <0.0010 | 0.0057 | |
| | Magnesium (Mg)-Total (mg/L) | | 69.6 | | <0.10 | 18.9 | |
| | Manganese (Mn)-Total (mg/L) | | 0.0226 | | <0.00010 | 0.00372 | |
| | Mercury (Hg)-Total (ug/L) | | 0.00189 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.00228 | | <0.000050 | 0.000980 | |
| | Nickel (Ni)-Total (mg/L) | | 0.00133 | | <0.00050 | <0.00050 | |
| | Potassium (K)-Total (mg/L) | | 1.93 | | <0.050 | 0.559 | |
| | Selenium (Se)-Total (ug/L) | | 68.7 | | <0.050 | 5.25 | |
| | Silicon (Si)-Total (mg/L) | | 2.91 | | <0.10 | 0.29 | |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | <0.000010 | |
| | Sodium (Na)-Total (mg/L) | | 8.42 | | <0.050 | 5.27 | |
| | Strontium (Sr)-Total (mg/L) | | 0.393 | | <0.00020 | 0.179 | |
| | Thallium (Tl)-Total (mg/L) | | 0.000018 | | <0.000010 | <0.000010 | |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | <0.010 | |
| | Uranium (U)-Total (mg/L) | | 0.00328 | | <0.000010 | 0.000942 | |
| | Vanadium (V)-Total (mg/L) | | 0.00079 | | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Total (mg/L) | | 0.0050 | | <0.0030 | <0.0030 | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | LAB | |
| | Dissolved Metals Filtration Location | | LAB | | LAB | LAB | |
| | Aluminum (Al)-Dissolved (mg/L) | | 0.0048 | | <0.0030 | <0.0030 | |
| | Antimony (Sb)-Dissolved (mg/L) | | 0.00039 | | <0.00010 | 0.00013 | |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00015 | | <0.00010 | 0.00020 | |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0928 | | <0.00010 | 0.0941 | |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | | 0.022 | | <0.010 | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | | <0.0050 | | <0.0050 | <0.0050 | |
| | Calcium (Ca)-Dissolved (mg/L) | | 120 | | <0.050 | 54.0 | |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | 0.00014 | |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-6 | L2272864-7 | L2272864-8 | L2272864-9 | L2272864-10 |
|-------------------------|---------------------------------------|--------------|----------------------------|----------------------------------|----------------------------|----------------------------------|------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | Sampled Time | 10:17 | 10:17 | 13:07 | 13:07 | 13:56 |
| | | Client ID | RG_ER_WS_2019 0513-1017 | RG_ER_WS_2019 0513-1017 FB-HG | RG_GC_WS_2019 0513-1307 | RG_GC_WS_2019 0513-1307 FB-HG | RG_EROL_WS_20 190513-1356 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 32.3 | | 33.4 | | 62.8 |
| | Chromium (Cr)-Total (mg/L) | | 0.00022 | | 0.00017 | | 0.00017 |
| | Cobalt (Co)-Total (ug/L) | | 0.10 | | <0.10 | | <0.10 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Total (mg/L) | | 0.115 | | 0.067 | | 0.040 |
| | Lead (Pb)-Total (mg/L) | | 0.000233 | | 0.000094 | | <0.000050 |
| | Lithium (Li)-Total (mg/L) | | 0.0017 | | 0.0017 | | 0.0051 |
| | Magnesium (Mg)-Total (mg/L) | | 9.92 | | 10.7 | | 16.0 |
| | Manganese (Mn)-Total (mg/L) | | 0.0126 | | 0.00674 | | 0.00521 |
| | Mercury (Hg)-Total (ug/L) | | 0.00095 | <0.00050 | 0.00083 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.000594 | | 0.000453 | | 0.000738 |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Total (mg/L) | | 0.619 | | 0.650 | | 0.609 |
| | Selenium (Se)-Total (ug/L) | | 0.351 | | 0.643 | | 2.90 |
| | Silicon (Si)-Total (mg/L) | | 2.42 | | 2.87 | | 2.19 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 3.98 | | 3.82 | | 3.64 |
| | Strontium (Sr)-Total (mg/L) | | 0.122 | | 0.106 | | 0.174 |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.000618 | | 0.000590 | | 0.000651 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | | <0.0030 | | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | | LAB |
| | Dissolved Metals Filtration Location | | LAB | | LAB | | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | 0.0052 | | 0.0048 | | <0.0030 |
| | Antimony (Sb)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00037 | | 0.00034 | | 0.00014 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0375 | | 0.0473 | | 0.114 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | <0.0050 | | <0.0050 | | 0.0109 |
| | Calcium (Ca)-Dissolved (mg/L) | | 33.2 | | 33.8 | | 66.8 |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | 0.00011 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-11 | L2272864-12 | L2272864-13 | L2272864-14 | L2272864-15 |
|-------------------------|---------------------------------------|--------------|------------------------------------|-----------------------------|-----------------------------------|------------------------------|--------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | Sampled Time | 13:56 | 13:56 | 13:56 | 12:00 | 15:00 |
| | | Client ID | RG_EROL_WS_20 190513-1356 FB-HG | RG_DUP_WS_201 90513-1356 | RG_DUP_WS_201 90513-1356 FB-HG | RG_TRIP_WS_201 90513-0000 | RG_ELWDGC_WS _20190513-1500 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | | 63.4 | | <0.050 | 71.8 |
| | Chromium (Cr)-Total (mg/L) | | | 0.00016 | | <0.00010 | 0.00039 |
| | Cobalt (Co)-Total (ug/L) | | | <0.10 | | <0.10 | <0.10 |
| | Copper (Cu)-Total (mg/L) | | | <0.00050 | | <0.00050 | <0.00050 |
| | Iron (Fe)-Total (mg/L) | | | 0.035 | | <0.010 | 0.107 |
| | Lead (Pb)-Total (mg/L) | | | <0.000050 | | <0.000050 | 0.000102 |
| | Lithium (Li)-Total (mg/L) | | | 0.0050 | | <0.0010 | 0.0096 |
| | Magnesium (Mg)-Total (mg/L) | | | 16.2 | | <0.10 | 25.4 |
| | Manganese (Mn)-Total (mg/L) | | | 0.00512 | | <0.00010 | 0.00596 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | 0.00106 |
| | Molybdenum (Mo)-Total (mg/L) | | | 0.000737 | | <0.000050 | 0.00127 |
| | Nickel (Ni)-Total (mg/L) | | | <0.00050 | | <0.00050 | <0.00050 |
| | Potassium (K)-Total (mg/L) | | | 0.589 | | <0.050 | 0.750 |
| | Selenium (Se)-Total (ug/L) | | | 2.91 | | <0.050 | 15.8 |
| | Silicon (Si)-Total (mg/L) | | | 2.21 | | <0.10 | 2.13 |
| | Silver (Ag)-Total (mg/L) | | | <0.000010 | | <0.000010 | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | | 3.64 | | <0.050 | 2.76 |
| | Strontium (Sr)-Total (mg/L) | | | 0.173 | | <0.00020 | 0.261 |
| | Thallium (Tl)-Total (mg/L) | | | <0.000010 | | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | | <0.00010 | | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | | <0.010 | | <0.010 | <0.010 |
| | Uranium (U)-Total (mg/L) | | | 0.000658 | | <0.000010 | 0.00135 |
| | Vanadium (V)-Total (mg/L) | | | <0.00050 | | <0.00050 | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | | <0.0030 | | <0.0030 | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | LAB | | | LAB |
| | Dissolved Metals Filtration Location | | | LAB | | LAB | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | | <0.0030 | | | <0.0030 |
| | Antimony (Sb)-Dissolved (mg/L) | | | <0.00010 | | | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | | 0.00013 | | | <0.00010 |
| | Barium (Ba)-Dissolved (mg/L) | | | 0.114 | | | 0.0730 |
| | Beryllium (Be)-Dissolved (ug/L) | | | <0.020 | | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | | <0.000050 | | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | | <0.010 | | | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | | 0.0095 | | | 0.0056 |
| | Calcium (Ca)-Dissolved (mg/L) | | | 64.5 | | <0.050 | 71.2 |
| | Chromium (Cr)-Dissolved (mg/L) | | | 0.00011 | | | 0.00016 |
| | Cobalt (Co)-Dissolved (ug/L) | | | <0.10 | | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-16 | L2272864-17 | L2272864-18 | | |
|-------------------------|---------------------------------------|--------------|---|-------------------------------|---|--|--|
| | | Description | WS | WS | WS | | |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | | |
| | | Sampled Time | 15:00 | 08:44 | 08:44 | | |
| | | Client ID | RG_ELWDGC_WS _20190513-1500 FB-HG | RG_ERIMF_WS_2 0190513-0844 | RG_ERIMF_WS_2 0190513-0844 FB- HG | | |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | | 57.8 | | | |
| | Chromium (Cr)-Total (mg/L) | | | 0.00015 | | | |
| | Cobalt (Co)-Total (ug/L) | | | <0.10 | | | |
| | Copper (Cu)-Total (mg/L) | | | <0.00050 | | | |
| | Iron (Fe)-Total (mg/L) | | | 0.067 | | | |
| | Lead (Pb)-Total (mg/L) | | | 0.000052 | | | |
| | Lithium (Li)-Total (mg/L) | | | 0.0048 | | | |
| | Magnesium (Mg)-Total (mg/L) | | | 11.8 | | | |
| | Manganese (Mn)-Total (mg/L) | | | 0.0226 | | | |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | <0.00050 | | |
| | Molybdenum (Mo)-Total (mg/L) | | | 0.00137 | | | |
| | Nickel (Ni)-Total (mg/L) | | | 0.00088 | | | |
| | Potassium (K)-Total (mg/L) | | | 1.36 | | | |
| | Selenium (Se)-Total (ug/L) | | | 0.082 | | | |
| | Silicon (Si)-Total (mg/L) | | | 1.46 | | | |
| | Silver (Ag)-Total (mg/L) | | | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | | | 9.12 | | | |
| | Strontium (Sr)-Total (mg/L) | | | 0.174 | | | |
| | Thallium (Tl)-Total (mg/L) | | | <0.000010 | | | |
| | Tin (Sn)-Total (mg/L) | | | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | | | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | | | 0.000374 | | | |
| | Vanadium (V)-Total (mg/L) | | | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | | | <0.0030 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | LAB | | | |
| | Dissolved Metals Filtration Location | | | LAB | | | |
| | Aluminum (Al)-Dissolved (mg/L) | | | 0.0032 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | | | 0.00018 | | | |
| | Arsenic (As)-Dissolved (mg/L) | | | 0.00038 | | | |
| | Barium (Ba)-Dissolved (mg/L) | | | 0.172 | | | |
| | Beryllium (Be)-Dissolved (ug/L) | | | <0.020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | | | <0.010 | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | <0.0050 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | | | 59.7 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | | | 0.00012 | | | |
| | Cobalt (Co)-Dissolved (ug/L) | | | <0.10 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | Description | Sampled Date | Sampled Time | Client ID | L2272864-1 | L2272864-2 | L2272864-3 | L2272864-4 | L2272864-5 |
|-------------------------|----------------------------------|--------------|--------------|-----------|---------------|-----------------|---------------|---------------|-----------------|
| | | | | | WS | WS | WS | WS | WS |
| | | 13-MAY-19 | 08:51 | | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | | | | 08:51 | 08:51 | 08:51 | 09:32 | 09:32 |
| | | | | | RG_GO13_WS_20 | RG_GO13_WS_20 | RG_FBLANK_WS_ | RG_STPD_WS_20 | RG_STPD_WS_20 |
| | | | | | 190513-0851 | 190513-0851 FB- | 20190513-0851 | 190513-0932 | 190513-0932 FB- |
| | | | | | | HG | | | HG |
| Grouping | Analyte | | | | | | | | |
| WATER | | | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | | <0.00050 | | <0.00050 | <0.00050 | |
| | Iron (Fe)-Dissolved (mg/L) | | | | <0.010 | | <0.010 | <0.010 | |
| | Lead (Pb)-Dissolved (mg/L) | | | | <0.000050 | | <0.000050 | <0.000050 | |
| | Lithium (Li)-Dissolved (mg/L) | | | | 0.0253 | | <0.0010 | 0.0053 | |
| | Magnesium (Mg)-Dissolved (mg/L) | | | | 70.6 | | <0.10 | 19.1 | |
| | Manganese (Mn)-Dissolved (mg/L) | | | | 0.0106 | | <0.00010 | 0.00012 | |
| | Mercury (Hg)-Dissolved (mg/L) | | | | <0.0000050 | | <0.0000050 | <0.0000050 | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | | 0.00201 | | <0.000050 | 0.000885 | |
| | Nickel (Ni)-Dissolved (mg/L) | | | | 0.00103 | | <0.00050 | <0.00050 | |
| | Potassium (K)-Dissolved (mg/L) | | | | 1.91 | | <0.050 | 0.551 | |
| | Selenium (Se)-Dissolved (ug/L) | | | | 78.7 | | <0.050 | 5.65 | |
| | Silicon (Si)-Dissolved (mg/L) | | | | 2.59 | | <0.050 | 0.211 | |
| | Silver (Ag)-Dissolved (mg/L) | | | | <0.000010 | | <0.000010 | <0.000010 | |
| | Sodium (Na)-Dissolved (mg/L) | | | | 8.11 | | <0.050 | 5.00 | |
| | Strontium (Sr)-Dissolved (mg/L) | | | | 0.353 | | <0.00020 | 0.169 | |
| | Thallium (Tl)-Dissolved (mg/L) | | | | 0.000015 | | <0.000010 | <0.000010 | |
| | Tin (Sn)-Dissolved (mg/L) | | | | <0.00010 | | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Dissolved (mg/L) | | | | <0.010 | | <0.010 | <0.010 | |
| | Uranium (U)-Dissolved (mg/L) | | | | 0.00347 | | <0.000010 | 0.000999 | |
| | Vanadium (V)-Dissolved (mg/L) | | | | <0.00050 | | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Dissolved (mg/L) | | | | 0.0018 | | <0.0010 | <0.0010 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | L2272864-6 WS 13-MAY-19 10:17 RG_ER_WS_2019 0513-1017 | L2272864-7 WS 13-MAY-19 10:17 RG_ER_WS_2019 0513-1017 FB-HG | L2272864-8 WS 13-MAY-19 13:07 RG_GC_WS_2019 0513-1307 | L2272864-9 WS 13-MAY-19 13:07 RG_GC_WS_2019 0513-1307 FB-HG | L2272864-10 WS 13-MAY-19 13:56 RG_EROL_WS_20 190513-1356 |
|---|--|--|--|--|---|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0015 | 0.0015 | 0.0048 | 0.0048 |
| | Magnesium (Mg)-Dissolved (mg/L) | 9.96 | 10.7 | 16.4 | 16.4 |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00037 | 0.00017 | 0.00301 | 0.00301 |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000539 | 0.000417 | 0.000657 | 0.000657 |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | 0.599 | 0.605 | 0.604 | 0.604 |
| | Selenium (Se)-Dissolved (ug/L) | 0.425 | 0.752 | 3.36 | 3.36 |
| | Silicon (Si)-Dissolved (mg/L) | 2.17 | 2.78 | 2.25 | 2.25 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | 4.10 | 3.67 | 3.76 | 3.76 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.122 | 0.108 | 0.174 | 0.174 |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | 0.000657 | 0.000658 | 0.000695 | 0.000695 |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2272864-11 | L2272864-12 | L2272864-13 | L2272864-14 | L2272864-15 |
|-------------------------|----------------------------------|--------------|--|-----------------------------|-----------------------------------|------------------------------|--------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 | 13-MAY-19 |
| | | Sampled Time | 13:56 | 13:56 | 13:56 | 12:00 | 15:00 |
| | | Client ID | RG_EROL_WS_20 190513-1356 FB- HG | RG_DUP_WS_201 90513-1356 | RG_DUP_WS_201 90513-1356 FB-HG | RG_TRIP_WS_201 90513-0000 | RG_ELWDGC_WS _20190513-1500 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | <0.00050 | | | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | | | <0.010 | | | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | | | <0.000050 | | | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | | | 0.0047 | | | 0.0090 |
| | Magnesium (Mg)-Dissolved (mg/L) | | | 16.3 | | <0.0050 | 25.8 |
| | Manganese (Mn)-Dissolved (mg/L) | | | 0.00283 | | | 0.00023 |
| | Mercury (Hg)-Dissolved (mg/L) | | | <0.0000050 | | | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | 0.000638 | | | 0.00113 |
| | Nickel (Ni)-Dissolved (mg/L) | | | <0.00050 | | | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | | | 0.601 | | <0.050 | 0.698 |
| | Selenium (Se)-Dissolved (ug/L) | | | 3.39 | | | 18.4 |
| | Silicon (Si)-Dissolved (mg/L) | | | 2.20 | | | 2.06 |
| | Silver (Ag)-Dissolved (mg/L) | | | <0.000010 | | | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | | | 3.65 | | <0.050 | 2.83 |
| | Strontium (Sr)-Dissolved (mg/L) | | | 0.171 | | | 0.251 |
| | Thallium (Tl)-Dissolved (mg/L) | | | <0.000010 | | | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | | | <0.00010 | | | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | | | <0.010 | | | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | | | 0.000707 | | | 0.00140 |
| | Vanadium (V)-Dissolved (mg/L) | | | <0.00050 | | | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | | | <0.0010 | | | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2272864-16 WS 13-MAY-19 15:00 RG_ELWDGC_WS _20190513-1500 FB-HG | L2272864-17 WS 13-MAY-19 08:44 RG_ERIMF_WS_2 0190513-0844 | L2272864-18 WS 13-MAY-19 08:44 RG_ERIMF_WS_2 0190513-0844 FB- HG | | |
|-------------------------|---|--|--|--|--|--|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | | <0.010 | | | |
| | Lead (Pb)-Dissolved (mg/L) | | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | | 0.0045 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | | 11.6 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | | 0.00011 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | 0.00125 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | | 0.00078 | | | |
| | Potassium (K)-Dissolved (mg/L) | | 1.36 | | | |
| | Selenium (Se)-Dissolved (ug/L) | | 0.066 | | | |
| | Silicon (Si)-Dissolved (mg/L) | | 1.37 | | | |
| | Silver (Ag)-Dissolved (mg/L) | | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | | 8.93 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | | 0.167 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | | 0.000397 | | | |
| | Vanadium (V)-Dissolved (mg/L) | | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | | <0.0010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC, DIS METALS LAB FILTER/PRESERVE |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|---------------------------|-----------|---|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Molybdenum (Mo)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Potassium (K)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Selenium (Se)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2272864-3 |
| Matrix Spike | Uranium (U)-Dissolved | MS-B | L2272864-10, -12, -15, -17, -6, -8 |
| Matrix Spike | Aluminum (Al)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Manganese (Mn)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Selenium (Se)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Sodium (Na)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2272864-1, -10, -12, -14, -15, -17, -3, -4, -6, -8 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RRV | Reported Result Verified By Repeat Analysis |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |

Reference Information

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Reference Information

| | | | |
|---|-------|--|---|
| NH3-L-F-CL | Water | Ammonia, Total (as N) | J. ENVIRON. MONIT., 2005, 7, 37-42, RSC |
| This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al. | | | |
| NO2-L-IC-N-CL | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-L-IC-N-CL | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| ORP-CL | Water | Oxidation redution potential by elect. | ASTM D1498 |
| This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV. | | | |
| It is recommended that this analysis be conducted in the field. | | | |
| P-T-L-COL-CL | Water | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. | | | |
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

Reference Information

REP-Lentic 19-12 - 2

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2272864

Report Date: 22-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|--------------------|-----------|-----------|-------|-----|---------|-----------|
| BE-T-L-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 17-MAY-19 |
| WG3052239-4 | MS | L2272864-1 | | | | | | |
| Beryllium (Be)-Total | | | 98.4 | | % | | 70-130 | 17-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4635267 | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Bromide (Br) | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Bromide (Br) | | | 103.7 | | % | | 85-115 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Bromide (Br) | | | 102.9 | | % | | 85-115 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 14-MAY-19 |
| WG3050253-16 | MS | L2272864-14 | | | | | | |
| Bromide (Br) | | | 103.1 | | % | | 75-125 | 14-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4638391 | | | | | | | |
| WG3053936-3 | DUP | L2272864-15 | | | | | | |
| Dissolved Organic Carbon | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 19-MAY-19 |
| WG3053936-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 97.1 | | % | | 80-120 | 19-MAY-19 |
| WG3053936-6 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 101.6 | | % | | 80-120 | 19-MAY-19 |
| WG3053936-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 19-MAY-19 |
| WG3053936-5 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 19-MAY-19 |
| WG3053936-4 | MS | L2272864-17 | | | | | | |
| Dissolved Organic Carbon | | | 95.8 | | % | | 70-130 | 19-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4638391 | | | | | | | |
| WG3053936-3 | DUP | L2272864-15 | | | | | | |
| Total Organic Carbon | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 19-MAY-19 |
| WG3053936-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 102.8 | | % | | 80-120 | 19-MAY-19 |



Quality Control Report

Workorder: L2272864

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|------------|--------------------|--------|-----------|-------|-----|--------|-----------|
| C-TOT-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4638391 | | | | | | | |
| WG3053936-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 101.0 | | % | | 80-120 | 19-MAY-19 |
| WG3053936-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 19-MAY-19 |
| WG3053936-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 19-MAY-19 |
| WG3053936-4 | MS | L2272864-17 | | | | | | |
| Total Organic Carbon | | | 110.9 | | % | | 70-130 | 19-MAY-19 |
| CL-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4635267 | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Chloride (Cl) | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Chloride (Cl) | | | 99.5 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Chloride (Cl) | | | 99.5 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 14-MAY-19 |
| WG3050253-16 | MS | L2272864-14 | | | | | | |
| Chloride (Cl) | | | 100.6 | | % | | 75-125 | 14-MAY-19 |
| EC-L-PCT-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4637446 | | | | | | | |
| WG3052842-3 | DUP | L2272864-6 | | | | | | |
| Conductivity (@ 25C) | | 242 | 242 | | uS/cm | 0.0 | 10 | 17-MAY-19 |
| WG3052842-2 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 102.9 | | % | | 90-110 | 17-MAY-19 |
| WG3052842-5 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 102.9 | | % | | 90-110 | 17-MAY-19 |
| WG3052842-1 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 17-MAY-19 |
| WG3052842-4 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 17-MAY-19 |
| F-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |



Quality Control Report

Workorder: L2272864

Report Date: 22-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|--------------------|------------|-----------|-------|-----|----------|-----------|
| F-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4635267 | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Fluoride (F) | | <0.020 | <0.020 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Fluoride (F) | | | 103.6 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Fluoride (F) | | | 103.2 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 14-MAY-19 |
| WG3050253-16 | MS | L2272864-14 | | | | | | |
| Fluoride (F) | | | 104.2 | | % | | 75-125 | 14-MAY-19 |
| HG-D-CVAA-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4639533 | | | | | | | |
| WG3054696-2 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 100.6 | | % | | 80-120 | 21-MAY-19 |
| WG3054696-1 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 21-MAY-19 |
| WG3054696-4 | MS | L2272864-1 | | | | | | |
| Mercury (Hg)-Dissolved | | | 102.3 | | % | | 70-130 | 21-MAY-19 |
| HG-T-U-CVAF-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4638022 | | | | | | | |
| WG3053487-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 96.8 | | % | | 80-120 | 18-MAY-19 |
| WG3053487-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 18-MAY-19 |
| Batch | R4639602 | | | | | | | |
| WG3054527-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 102.0 | | % | | 80-120 | 21-MAY-19 |
| WG3054527-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 21-MAY-19 |
| WG3054527-4 | MS | L2272864-18 | | | | | | |
| Mercury (Hg)-Total | | | 95.2 | | % | | 70-130 | 21-MAY-19 |
| MET-D-CCMS-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4639708 | | | | | | | |
| WG3054655-11 | DUP | L2272864-14 | | | | | | |
| Calcium (Ca)-Dissolved | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 21-MAY-19 |
| Magnesium (Mg)-Dissolved | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 21-MAY-19 |



Quality Control Report

Workorder: L2272864

Report Date: 22-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|--------------------|---------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639708 | | | | | | | |
| WG3054655-11 | DUP | L2272864-14 | | | | | | |
| Potassium (K)-Dissolved | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 21-MAY-19 |
| Sodium (Na)-Dissolved | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 21-MAY-19 |
| WG3054655-6 | LCS | | | | | | | |
| Calcium (Ca)-Dissolved | | | 95.4 | | % | | 80-120 | 21-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 95.3 | | % | | 80-120 | 21-MAY-19 |
| Potassium (K)-Dissolved | | | 105.1 | | % | | 80-120 | 21-MAY-19 |
| Sodium (Na)-Dissolved | | | 98.9 | | % | | 80-120 | 21-MAY-19 |
| WG3054655-5 | MB | | | | | | | |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 21-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 21-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 21-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 21-MAY-19 |
| WG3054655-12 | MS | L2272864-14 | | | | | | |
| Calcium (Ca)-Dissolved | | | 100.4 | | % | | 70-130 | 21-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 100.8 | | % | | 70-130 | 21-MAY-19 |
| Potassium (K)-Dissolved | | | 112.4 | | % | | 70-130 | 21-MAY-19 |
| Sodium (Na)-Dissolved | | | 104.6 | | % | | 70-130 | 21-MAY-19 |
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637723 | | | | | | | |
| WG3052264-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 99.9 | | % | | 80-120 | 17-MAY-19 |
| Antimony (Sb)-Dissolved | | | 90.1 | | % | | 80-120 | 17-MAY-19 |
| Arsenic (As)-Dissolved | | | 97.1 | | % | | 80-120 | 17-MAY-19 |
| Barium (Ba)-Dissolved | | | 98.9 | | % | | 80-120 | 17-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 106.9 | | % | | 80-120 | 17-MAY-19 |
| Boron (B)-Dissolved | | | 92.5 | | % | | 80-120 | 17-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 96.1 | | % | | 80-120 | 17-MAY-19 |
| Calcium (Ca)-Dissolved | | | 94.4 | | % | | 80-120 | 17-MAY-19 |
| Chromium (Cr)-Dissolved | | | 99.4 | | % | | 80-120 | 17-MAY-19 |
| Cobalt (Co)-Dissolved | | | 97.5 | | % | | 80-120 | 17-MAY-19 |
| Copper (Cu)-Dissolved | | | 96.7 | | % | | 80-120 | 17-MAY-19 |
| Iron (Fe)-Dissolved | | | 95.3 | | % | | 80-120 | 17-MAY-19 |
| Lead (Pb)-Dissolved | | | 102.5 | | % | | 80-120 | 17-MAY-19 |
| Lithium (Li)-Dissolved | | | 92.2 | | % | | 80-120 | 17-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 106.6 | | % | | 80-120 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|--------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637723 | | | | | | | |
| WG3052264-2 | LCS | | | | | | | |
| Manganese (Mn)-Dissolved | | | 101.9 | | % | | 80-120 | 17-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 92.8 | | % | | 80-120 | 17-MAY-19 |
| Nickel (Ni)-Dissolved | | | 96.0 | | % | | 80-120 | 17-MAY-19 |
| Potassium (K)-Dissolved | | | 99.0 | | % | | 80-120 | 17-MAY-19 |
| Selenium (Se)-Dissolved | | | 95.2 | | % | | 80-120 | 17-MAY-19 |
| Silicon (Si)-Dissolved | | | 99.8 | | % | | 60-140 | 17-MAY-19 |
| Silver (Ag)-Dissolved | | | 86.1 | | % | | 80-120 | 17-MAY-19 |
| Sodium (Na)-Dissolved | | | 95.7 | | % | | 80-120 | 17-MAY-19 |
| Strontium (Sr)-Dissolved | | | 94.2 | | % | | 80-120 | 17-MAY-19 |
| Thallium (Tl)-Dissolved | | | 100.5 | | % | | 80-120 | 17-MAY-19 |
| Tin (Sn)-Dissolved | | | 91.3 | | % | | 80-120 | 17-MAY-19 |
| Titanium (Ti)-Dissolved | | | 95.3 | | % | | 80-120 | 17-MAY-19 |
| Uranium (U)-Dissolved | | | 101.7 | | % | | 80-120 | 17-MAY-19 |
| Vanadium (V)-Dissolved | | | 100.3 | | % | | 80-120 | 17-MAY-19 |
| Zinc (Zn)-Dissolved | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| WG3052567-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 103.5 | | % | | 80-120 | 17-MAY-19 |
| Antimony (Sb)-Dissolved | | | 91.0 | | % | | 80-120 | 17-MAY-19 |
| Arsenic (As)-Dissolved | | | 101.8 | | % | | 80-120 | 17-MAY-19 |
| Barium (Ba)-Dissolved | | | 104.1 | | % | | 80-120 | 17-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 102.7 | | % | | 80-120 | 17-MAY-19 |
| Boron (B)-Dissolved | | | 88.9 | | % | | 80-120 | 17-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 99.3 | | % | | 80-120 | 17-MAY-19 |
| Calcium (Ca)-Dissolved | | | 96.9 | | % | | 80-120 | 17-MAY-19 |
| Chromium (Cr)-Dissolved | | | 102.2 | | % | | 80-120 | 17-MAY-19 |
| Cobalt (Co)-Dissolved | | | 100.1 | | % | | 80-120 | 17-MAY-19 |
| Copper (Cu)-Dissolved | | | 98.8 | | % | | 80-120 | 17-MAY-19 |
| Iron (Fe)-Dissolved | | | 97.8 | | % | | 80-120 | 17-MAY-19 |
| Lead (Pb)-Dissolved | | | 94.8 | | % | | 80-120 | 17-MAY-19 |
| Lithium (Li)-Dissolved | | | 89.8 | | % | | 80-120 | 17-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 107.5 | | % | | 80-120 | 17-MAY-19 |
| Manganese (Mn)-Dissolved | | | 100.6 | | % | | 80-120 | 17-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 92.3 | | % | | 80-120 | 17-MAY-19 |
| Nickel (Ni)-Dissolved | | | 98.3 | | % | | 80-120 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637723 | | | | | | | |
| WG3052567-2 | LCS | | | | | | | |
| Potassium (K)-Dissolved | | | 102.0 | | % | | 80-120 | 17-MAY-19 |
| Selenium (Se)-Dissolved | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| Silicon (Si)-Dissolved | | | 98.6 | | % | | 60-140 | 17-MAY-19 |
| Silver (Ag)-Dissolved | | | 90.6 | | % | | 80-120 | 17-MAY-19 |
| Sodium (Na)-Dissolved | | | 96.8 | | % | | 80-120 | 17-MAY-19 |
| Strontium (Sr)-Dissolved | | | 95.2 | | % | | 80-120 | 17-MAY-19 |
| Thallium (Tl)-Dissolved | | | 94.6 | | % | | 80-120 | 17-MAY-19 |
| Tin (Sn)-Dissolved | | | 93.1 | | % | | 80-120 | 17-MAY-19 |
| Titanium (Ti)-Dissolved | | | 97.2 | | % | | 80-120 | 17-MAY-19 |
| Uranium (U)-Dissolved | | | 95.8 | | % | | 80-120 | 17-MAY-19 |
| Vanadium (V)-Dissolved | | | 102.6 | | % | | 80-120 | 17-MAY-19 |
| Zinc (Zn)-Dissolved | | | 101.2 | | % | | 80-120 | 17-MAY-19 |
| WG3052264-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 17-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637723 | | | | | | | |
| WG3052264-1 MB | | LF | | | | | | |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 17-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| WG3052567-1 MB | | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 17-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637723 | | | | | | | |
| WG3052567-1 | MB | LF | | | | | | |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 17-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Batch | R4638064 | | | | | | | |
| WG3053299-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 100.1 | | % | | 80-120 | 18-MAY-19 |
| Antimony (Sb)-Dissolved | | | 92.5 | | % | | 80-120 | 18-MAY-19 |
| Arsenic (As)-Dissolved | | | 94.9 | | % | | 80-120 | 18-MAY-19 |
| Barium (Ba)-Dissolved | | | 100.9 | | % | | 80-120 | 18-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 94.2 | | % | | 80-120 | 18-MAY-19 |
| Boron (B)-Dissolved | | | 87.8 | | % | | 80-120 | 18-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 93.5 | | % | | 80-120 | 18-MAY-19 |
| Calcium (Ca)-Dissolved | | | 93.1 | | % | | 80-120 | 18-MAY-19 |
| Chromium (Cr)-Dissolved | | | 94.2 | | % | | 80-120 | 18-MAY-19 |
| Cobalt (Co)-Dissolved | | | 96.0 | | % | | 80-120 | 18-MAY-19 |
| Copper (Cu)-Dissolved | | | 95.2 | | % | | 80-120 | 18-MAY-19 |
| Iron (Fe)-Dissolved | | | 94.7 | | % | | 80-120 | 18-MAY-19 |
| Lead (Pb)-Dissolved | | | 94.6 | | % | | 80-120 | 18-MAY-19 |
| Lithium (Li)-Dissolved | | | 85.9 | | % | | 80-120 | 18-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 99.4 | | % | | 80-120 | 18-MAY-19 |
| Manganese (Mn)-Dissolved | | | 97.4 | | % | | 80-120 | 18-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 97.0 | | % | | 80-120 | 18-MAY-19 |
| Nickel (Ni)-Dissolved | | | 95.1 | | % | | 80-120 | 18-MAY-19 |
| Potassium (K)-Dissolved | | | 102.7 | | % | | 80-120 | 18-MAY-19 |
| Selenium (Se)-Dissolved | | | 97.8 | | % | | 80-120 | 18-MAY-19 |
| Silicon (Si)-Dissolved | | | 93.9 | | % | | 60-140 | 18-MAY-19 |
| Silver (Ag)-Dissolved | | | 92.9 | | % | | 80-120 | 18-MAY-19 |
| Sodium (Na)-Dissolved | | | 96.3 | | % | | 80-120 | 18-MAY-19 |
| Strontium (Sr)-Dissolved | | | 92.1 | | % | | 80-120 | 18-MAY-19 |
| Thallium (Tl)-Dissolved | | | 95.5 | | % | | 80-120 | 18-MAY-19 |
| Tin (Sn)-Dissolved | | | 90.9 | | % | | 80-120 | 18-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4638064 | | | | | | | |
| WG3053299-2 | LCS | | | | | | | |
| Titanium (Ti)-Dissolved | | | 95.7 | | % | | 80-120 | 18-MAY-19 |
| Uranium (U)-Dissolved | | | 89.5 | | % | | 80-120 | 18-MAY-19 |
| Vanadium (V)-Dissolved | | | 96.7 | | % | | 80-120 | 18-MAY-19 |
| Zinc (Zn)-Dissolved | | | 93.9 | | % | | 80-120 | 18-MAY-19 |
| WG3053299-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 18-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 18-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 18-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 18-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 18-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 18-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 18-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 18-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 18-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-------------------|-----------|-----------|-------|----------|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4638064 | | | | | | | |
| WG3053299-1 MB | | LF | | | | | | |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-3 DUP | | L2272864-4 | | | | | | |
| Aluminum (Al)-Total | | 0.0167 | 0.0156 | | mg/L | 6.3 | 20 | 17-MAY-19 |
| Antimony (Sb)-Total | | 0.00015 | 0.00014 | | mg/L | 7.1 | 20 | 17-MAY-19 |
| Arsenic (As)-Total | | 0.00020 | 0.00021 | | mg/L | 6.9 | 20 | 17-MAY-19 |
| Barium (Ba)-Total | | 0.0870 | 0.0852 | | mg/L | 2.1 | 20 | 17-MAY-19 |
| Bismuth (Bi)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Boron (B)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Cadmium (Cd)-Total | | 0.0000061 | 0.0000090 | J | mg/L | 0.000002 | 0.00001 | 17-MAY-19 |
| Calcium (Ca)-Total | | 51.8 | 50.4 | | mg/L | 2.7 | 20 | 17-MAY-19 |
| Chromium (Cr)-Total | | 0.00015 | 0.00021 | J | mg/L | 0.00006 | 0.0002 | 17-MAY-19 |
| Cobalt (Co)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Copper (Cu)-Total | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Iron (Fe)-Total | | 0.047 | 0.046 | | mg/L | 0.5 | 20 | 17-MAY-19 |
| Lead (Pb)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Lithium (Li)-Total | | 0.0057 | 0.0057 | | mg/L | 0.9 | 20 | 17-MAY-19 |
| Magnesium (Mg)-Total | | 18.9 | 19.0 | | mg/L | 0.8 | 20 | 17-MAY-19 |
| Manganese (Mn)-Total | | 0.00372 | 0.00366 | | mg/L | 1.4 | 20 | 17-MAY-19 |
| Molybdenum (Mo)-Total | | 0.000980 | 0.00101 | | mg/L | 3.1 | 20 | 17-MAY-19 |
| Nickel (Ni)-Total | | <0.00050 | 0.00052 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Potassium (K)-Total | | 0.559 | 0.603 | | mg/L | 7.4 | 20 | 17-MAY-19 |
| Selenium (Se)-Total | | 0.00525 | 0.00530 | | mg/L | 1.0 | 20 | 17-MAY-19 |
| Silicon (Si)-Total | | 0.29 | 0.29 | | mg/L | 0.5 | 20 | 17-MAY-19 |
| Silver (Ag)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Sodium (Na)-Total | | 5.27 | 5.24 | | mg/L | 0.6 | 20 | 17-MAY-19 |
| Strontium (Sr)-Total | | 0.179 | 0.184 | | mg/L | 2.3 | 20 | 17-MAY-19 |
| Thallium (Tl)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Tin (Sn)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Titanium (Ti)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| Uranium (U)-Total | | 0.000942 | 0.000928 | | mg/L | 1.6 | 20 | 17-MAY-19 |
| Vanadium (V)-Total | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|----------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-3 | DUP | L2272864-4 | | | | | | |
| Zinc (Zn)-Total | | <0.0030 | <0.0030 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| WG3052239-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 104.2 | | % | | 80-120 | 17-MAY-19 |
| Antimony (Sb)-Total | | | 100.4 | | % | | 80-120 | 17-MAY-19 |
| Arsenic (As)-Total | | | 96.6 | | % | | 80-120 | 17-MAY-19 |
| Barium (Ba)-Total | | | 92.9 | | % | | 80-120 | 17-MAY-19 |
| Bismuth (Bi)-Total | | | 109.0 | | % | | 80-120 | 17-MAY-19 |
| Boron (B)-Total | | | 97.2 | | % | | 80-120 | 17-MAY-19 |
| Cadmium (Cd)-Total | | | 97.5 | | % | | 80-120 | 17-MAY-19 |
| Calcium (Ca)-Total | | | 103.9 | | % | | 80-120 | 17-MAY-19 |
| Chromium (Cr)-Total | | | 99.8 | | % | | 80-120 | 17-MAY-19 |
| Cobalt (Co)-Total | | | 98.0 | | % | | 80-120 | 17-MAY-19 |
| Copper (Cu)-Total | | | 96.2 | | % | | 80-120 | 17-MAY-19 |
| Iron (Fe)-Total | | | 97.5 | | % | | 80-120 | 17-MAY-19 |
| Lead (Pb)-Total | | | 103.7 | | % | | 80-120 | 17-MAY-19 |
| Lithium (Li)-Total | | | 99.0 | | % | | 80-120 | 17-MAY-19 |
| Magnesium (Mg)-Total | | | 102.7 | | % | | 80-120 | 17-MAY-19 |
| Manganese (Mn)-Total | | | 96.4 | | % | | 80-120 | 17-MAY-19 |
| Molybdenum (Mo)-Total | | | 102.4 | | % | | 80-120 | 17-MAY-19 |
| Nickel (Ni)-Total | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| Potassium (K)-Total | | | 102.1 | | % | | 80-120 | 17-MAY-19 |
| Selenium (Se)-Total | | | 96.3 | | % | | 80-120 | 17-MAY-19 |
| Silicon (Si)-Total | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| Silver (Ag)-Total | | | 98.2 | | % | | 80-120 | 17-MAY-19 |
| Sodium (Na)-Total | | | 104.7 | | % | | 80-120 | 17-MAY-19 |
| Strontium (Sr)-Total | | | 99.2 | | % | | 80-120 | 17-MAY-19 |
| Thallium (Tl)-Total | | | 102.5 | | % | | 80-120 | 17-MAY-19 |
| Tin (Sn)-Total | | | 97.6 | | % | | 80-120 | 17-MAY-19 |
| Titanium (Ti)-Total | | | 99.4 | | % | | 80-120 | 17-MAY-19 |
| Uranium (U)-Total | | | 96.8 | | % | | 80-120 | 17-MAY-19 |
| Vanadium (V)-Total | | | 100.3 | | % | | 80-120 | 17-MAY-19 |
| Zinc (Zn)-Total | | | 98.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052239-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 17-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-1 | MB | | | | | | | |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 17-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 17-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 17-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 17-MAY-19 |
| WG3052239-4 | MS | L2272864-1 | | | | | | |
| Aluminum (Al)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Antimony (Sb)-Total | | | 99.9 | | % | | 70-130 | 17-MAY-19 |
| Arsenic (As)-Total | | | 98.9 | | % | | 70-130 | 17-MAY-19 |
| Barium (Ba)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Bismuth (Bi)-Total | | | 90.7 | | % | | 70-130 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-4 | MS | L2272864-1 | | | | | | |
| Boron (B)-Total | | | 98.7 | | % | | 70-130 | 17-MAY-19 |
| Cadmium (Cd)-Total | | | 95.9 | | % | | 70-130 | 17-MAY-19 |
| Calcium (Ca)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Chromium (Cr)-Total | | | 95.8 | | % | | 70-130 | 17-MAY-19 |
| Cobalt (Co)-Total | | | 93.5 | | % | | 70-130 | 17-MAY-19 |
| Copper (Cu)-Total | | | 92.1 | | % | | 70-130 | 17-MAY-19 |
| Iron (Fe)-Total | | | 94.4 | | % | | 70-130 | 17-MAY-19 |
| Lead (Pb)-Total | | | 93.4 | | % | | 70-130 | 17-MAY-19 |
| Lithium (Li)-Total | | | 80.6 | | % | | 70-130 | 17-MAY-19 |
| Magnesium (Mg)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Manganese (Mn)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Molybdenum (Mo)-Total | | | 104.3 | | % | | 70-130 | 17-MAY-19 |
| Nickel (Ni)-Total | | | 93.0 | | % | | 70-130 | 17-MAY-19 |
| Potassium (K)-Total | | | 99.6 | | % | | 70-130 | 17-MAY-19 |
| Selenium (Se)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Silicon (Si)-Total | | | 88.7 | | % | | 70-130 | 17-MAY-19 |
| Silver (Ag)-Total | | | 97.1 | | % | | 70-130 | 17-MAY-19 |
| Sodium (Na)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Strontium (Sr)-Total | | | N/A | MS-B | % | | - | 17-MAY-19 |
| Thallium (Tl)-Total | | | 94.0 | | % | | 70-130 | 17-MAY-19 |
| Tin (Sn)-Total | | | 98.7 | | % | | 70-130 | 17-MAY-19 |
| Titanium (Ti)-Total | | | 82.0 | | % | | 70-130 | 17-MAY-19 |
| Uranium (U)-Total | | | 89.9 | | % | | 70-130 | 17-MAY-19 |
| Vanadium (V)-Total | | | 98.3 | | % | | 70-130 | 17-MAY-19 |
| Zinc (Zn)-Total | | | 92.5 | | % | | 70-130 | 17-MAY-19 |
| NH3-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639207 | | | | | | | |
| WG3054254-3 | DUP | L2272864-3 | | | | | | |
| Ammonia as N | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| WG3054254-2 | LCS | | | | | | | |
| Ammonia as N | | | 86.4 | | % | | 85-115 | 17-MAY-19 |
| WG3054254-1 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| WG3054254-4 | MS | L2272864-3 | | | | | | |
| Ammonia as N | | | 82.1 | | % | | 75-125 | 17-MAY-19 |

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|------------|--------------------|---------|-----------|-------|-----|--------|-----------|
| NH3-L-F-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4639513 | | | | | | | | |
| WG3054258-10 | LCS | | | | | | | |
| Ammonia as N | | | 90.7 | | % | | 85-115 | 17-MAY-19 |
| WG3054258-9 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| Batch R4640406 | | | | | | | | |
| WG3055365-2 | LCS | | | | | | | |
| Ammonia as N | | | 88.2 | | % | | 85-115 | 21-MAY-19 |
| WG3055365-1 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 21-MAY-19 |
| NO2-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4635267 | | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Nitrite (as N) | | <0.0010 | <0.0010 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Nitrite (as N) | | | 103.2 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Nitrite (as N) | | | 103.3 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 14-MAY-19 |
| WG3050253-16 | MS | L2272864-14 | | | | | | |
| Nitrite (as N) | | | 104.3 | | % | | 75-125 | 14-MAY-19 |
| NO3-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch R4635267 | | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Nitrate (as N) | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Nitrate (as N) | | | 97.4 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Nitrate (as N) | | | 97.8 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 14-MAY-19 |
| WG3050253-16 | MS | L2272864-14 | | | | | | |
| Nitrate (as N) | | | 98.5 | | % | | 75-125 | 14-MAY-19 |
| ORP-CL | | | | | | | | |
| Water | | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|----------|--------------|---------|-----------|-------|------|---------|-----------|
| ORP-CL | | Water | | | | | | |
| Batch | R4636998 | | | | | | | |
| WG3052349-5 | CRM | CL-ORP | | | | | | |
| ORP | | | 226 | | mV | | 210-230 | 16-MAY-19 |
| WG3052349-7 | CRM | CL-ORP | | | | | | |
| ORP | | | 223 | | mV | | 210-230 | 16-MAY-19 |
| WG3052349-8 | DUP | L2272864-17 | | | | | | |
| ORP | | 445 | 444 | J | mV | 0.8 | 15 | 16-MAY-19 |
| P-T-L-COL-CL | | Water | | | | | | |
| Batch | R4639827 | | | | | | | |
| WG3054783-18 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 97.8 | | % | | 80-120 | 21-MAY-19 |
| WG3054783-17 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 21-MAY-19 |
| PH-CL | | Water | | | | | | |
| Batch | R4637446 | | | | | | | |
| WG3052842-3 | DUP | L2272864-6 | | | | | | |
| pH | | 8.09 | 8.08 | J | pH | 0.01 | 0.2 | 17-MAY-19 |
| WG3052842-2 | LCS | | | | | | | |
| pH | | | 6.98 | | pH | | 6.9-7.1 | 17-MAY-19 |
| WG3052842-5 | LCS | | | | | | | |
| pH | | | 7.00 | | pH | | 6.9-7.1 | 17-MAY-19 |
| PO4-DO-L-COL-CL | | Water | | | | | | |
| Batch | R4635484 | | | | | | | |
| WG3050462-8 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 103.0 | | % | | 80-120 | 15-MAY-19 |
| WG3050462-7 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 15-MAY-19 |
| SO4-IC-N-CL | | Water | | | | | | |
| Batch | R4635267 | | | | | | | |
| WG3050253-15 | DUP | L2272864-14 | | | | | | |
| Sulfate (SO4) | | <0.30 | <0.30 | RPD-NA | mg/L | N/A | 20 | 14-MAY-19 |
| WG3050253-10 | LCS | | | | | | | |
| Sulfate (SO4) | | | 98.6 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-14 | LCS | | | | | | | |
| Sulfate (SO4) | | | 98.7 | | % | | 90-110 | 14-MAY-19 |
| WG3050253-13 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 14-MAY-19 |
| WG3050253-9 | MB | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|----------|--------------------|--------|-----------|-------|-----|--------|-----------|
| SO4-IC-N-CL | | | | | | | | |
| Batch | R4635267 | | | | | | | |
| WG3050253-9 MB | | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 14-MAY-19 |
| WG3050253-16 MS | | L2272864-14 | | | | | | |
| Sulfate (SO4) | | | 99.8 | | % | | 75-125 | 14-MAY-19 |
| SOLIDS-TDS-CL | | | | | | | | |
| Batch | R4638160 | | | | | | | |
| WG3053431-8 LCS | | | | | | | | |
| Total Dissolved Solids | | | 94.6 | | % | | 85-115 | 18-MAY-19 |
| WG3053431-7 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 18-MAY-19 |
| TKN-L-F-CL | | | | | | | | |
| Batch | R4640154 | | | | | | | |
| WG3055263-2 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 91.3 | | % | | 75-125 | 21-MAY-19 |
| WG3055263-6 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 93.1 | | % | | 75-125 | 21-MAY-19 |
| WG3055263-1 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 21-MAY-19 |
| WG3055263-5 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 21-MAY-19 |
| TSS-L-CL | | | | | | | | |
| Batch | R4639447 | | | | | | | |
| WG3053810-8 LCS | | | | | | | | |
| Total Suspended Solids | | | 93.9 | | % | | 85-115 | 19-MAY-19 |
| WG3053810-7 MB | | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 19-MAY-19 |
| TURBIDITY-CL | | | | | | | | |
| Batch | R4636103 | | | | | | | |
| WG3051153-11 LCS | | | | | | | | |
| Turbidity | | | 98.0 | | % | | 85-115 | 15-MAY-19 |
| WG3051153-8 LCS | | | | | | | | |
| Turbidity | | | 100.0 | | % | | 85-115 | 15-MAY-19 |
| WG3051153-10 MB | | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 15-MAY-19 |
| WG3051153-7 MB | | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 15-MAY-19 |

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | | | | | | | |
| | 1 | 13-MAY-19 08:51 | 16-MAY-19 16:00 | 0.25 | 79 | hours | EHTR-FM |
| | 3 | 13-MAY-19 08:51 | 16-MAY-19 16:00 | 0.25 | 79 | hours | EHTR-FM |
| | 4 | 13-MAY-19 09:32 | 16-MAY-19 16:00 | 0.25 | 78 | hours | EHTR-FM |
| | 6 | 13-MAY-19 10:17 | 16-MAY-19 16:00 | 0.25 | 78 | hours | EHTR-FM |
| | 8 | 13-MAY-19 13:07 | 16-MAY-19 16:35 | 0.25 | 75 | hours | EHTR-FM |
| | 10 | 13-MAY-19 13:56 | 16-MAY-19 16:35 | 0.25 | 75 | hours | EHTR-FM |
| | 12 | 13-MAY-19 13:56 | 16-MAY-19 16:35 | 0.25 | 75 | hours | EHTR-FM |
| | 14 | 13-MAY-19 12:00 | 16-MAY-19 16:35 | 0.25 | 77 | hours | EHTR-FM |
| | 15 | 13-MAY-19 15:00 | 16-MAY-19 16:35 | 0.25 | 74 | hours | EHTR-FM |
| | 17 | 13-MAY-19 08:44 | 16-MAY-19 16:35 | 0.25 | 80 | hours | EHTR-FM |
| pH | | | | | | | |
| | 1 | 13-MAY-19 08:51 | 17-MAY-19 09:00 | 0.25 | 96 | hours | EHTR-FM |
| | 3 | 13-MAY-19 08:51 | 17-MAY-19 09:00 | 0.25 | 96 | hours | EHTR-FM |
| | 4 | 13-MAY-19 09:32 | 17-MAY-19 09:00 | 0.25 | 96 | hours | EHTR-FM |
| | 6 | 13-MAY-19 10:17 | 17-MAY-19 09:00 | 0.25 | 95 | hours | EHTR-FM |
| | 8 | 13-MAY-19 13:07 | 17-MAY-19 09:00 | 0.25 | 92 | hours | EHTR-FM |
| | 10 | 13-MAY-19 13:56 | 17-MAY-19 09:00 | 0.25 | 91 | hours | EHTR-FM |
| | 12 | 13-MAY-19 13:56 | 17-MAY-19 09:00 | 0.25 | 91 | hours | EHTR-FM |
| | 14 | 13-MAY-19 12:00 | 17-MAY-19 09:00 | 0.25 | 93 | hours | EHTR-FM |
| | 15 | 13-MAY-19 15:00 | 17-MAY-19 09:00 | 0.25 | 90 | hours | EHTR-FM |
| | 17 | 13-MAY-19 08:44 | 17-MAY-19 09:00 | 0.25 | 96 | hours | EHTR-FM |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:
 Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
 Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2272864 were received on 14-MAY-19 13:45.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

| | | | | | | | | | | | | | |
|----------------------------|--|--------------------------------|--|----------|--------|-------------------|--|-------------------------------|----------|--------|--------------------------|-----|-----|
| COC ID: | | REP-Lentic 19-12 - 2 | | | | TURNAROUND TIME: | | | | | | | |
| PROJECT/CLIENT INFO | | | | | | LABORATORY | | | | | | | |
| Facility Name / Job# | | Regional Effects Program (REP) | | | | Lab Name | | ALS Calgary | | | Excel | PDF | EDD |
| Project Manager | | Cait Good | | | | Lab Contact | | Lyudmyla Shvets | | | | | |
| Email | | cait.good@teck.com | | | | Email | | lyudmyla.shvets@alsglobal.com | | | cait.good@teck.com | | |
| Address | | 421 Pine Avenue | | | | Address | | 2559 29 Street NE | | | teckcoal@equinonline.com | | |
| City | | Sparwood | | Province | BC | City | | Calgary | Province | AB | caite.shvets@teck.com | | |
| Postal Code | | V0B 2G0 | | Country | Canada | Postal Code | | T1Y 7B5 | Country | Canada | | | |
| Phone Number | | 250-425-8202 | | | | Phone Number | | 1 403 407 1794 | | | | | |

SAMPLE DETAILS

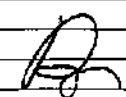
ANALYSIS REQUESTED

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-DCVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | PREPARED | ANALYSIS | FIELD LAB | LAB | FIELD | LAB | FIELD | LAB | |
|----------------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|-------------|-------------------|-------------------|----------|----------|-----------|-----|-------|-----|-------|-----|--|
| RG_GO13_WS_20190513-0851 | RG_GO13 | WS | No | 13-May-19 | 0851 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_GO13_WS_20190513-0851 FB-HG | RG_GO13 | WS | No | 13-May-19 | 0851 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_FBLANK_WS_20190513-0851 | RG_FBLANK | WS | No | 13-May-19 | 0851 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_STPD_WS_20190513-0932 | RG_STPD | WS | No | 13-May-19 | 0932 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_STPD_WS_20190513-0932 FB-HG | RG_STPD | WS | No | 13-May-19 | 0932 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_ER_WS_20190513-1017 | RG_ER | WS | No | 13-May-19 | 1017 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_ER_WS_20190513-1017 FB-HG | RG_ER | WS | No | 13-May-19 | 1017 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_GC_WS_20190513-1307 | RG_GC | WS | No | 13-May-19 | 1307 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_GC_WS_20190513-1307 FB-HG | RG_GC | WS | No | 13-May-19 | 1307 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_EROL_WS_20190513-1354 | RG_EROL | WS | No | 13-May-19 | 1356 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_EROL_WS_20190513-1356 FB-HG | RG_EROL | WS | No | 13-May-19 | 1356 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_DUP_WS_20190513-1356 | RG_DUP | WS | No | 13-May-19 | 1356 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_DUP_WS_20190513-1356 FB-HG | RG_DUP | WS | No | 13-May-19 | 1356 | G | 1 | | | | X | | | | | | | | | | | | |
| RG_TRIP_WS_20190513-8000 | RG_TRIP | WS | No | 13-May-19 | 0 | G | 4 | X | | | | X | X | X | | | | | | | | | |
| RG_ELWDGC_WS_20190513-1500 | RG_ELWDGC | WS | No | 13-May-19 | 1500 | G | 7 | X | X | X | X | X | X | X | | | | | | | | | |
| RG_ELWDGC_WS_20190513-1500 FB-HG | RG_ELWDGC | WS | No | 13-May-19 | 1500 | G | 1 | | | | X | | | | | | | | | | | | |

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L2272864-COFC

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|---|--|------------------------------------|--|------------------|--|---|--|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | | RELINQUISHED BY/AFFILIATION | | DATE/TIME | | ACCEPTED BY/AFFILIATION | |
| For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample? | | | | | |  5/14/19 14:50 | |
| NB OF BOTTLES RETURNED/DESCRIPTION | | | | | | | |
| Regular (default) <input checked="" type="checkbox"/> | | Sampler's Name | | | | Mobile # | |
| Priority (2-3 business days) - 50% surcharge | | Sampler's Signature | | | | Date/Time | |
| Emergency (1 Business Day) - 100% surcharge | | | | | | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | | | | | | |

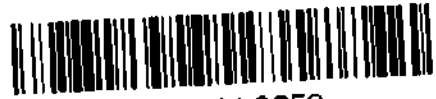
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| | | | | | | | |
|-------------------------------------|--------------------------------|------------------|--------|-------------------|-------------------------------|----------|--------|
| COC ID: REP-Lentic 19-12 - 2 | | TURNAROUND TIME: | | | | | |
| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
| Facility Name / Job# | Regional Effects Program (REP) | | | Lab Name | ALS Calgary | | |
| Project Manager | Cait Good | | | Lab Contact | Lyudmyla Shvets | | |
| Email | cait.good@teck.com | | | Email | lyudmyla.shvets@alsglobal.com | | |
| Address | 421 Pine Avenue | | | Address | 2559 29 Street NE | | |
| City | Sparwood | Province | BC | City | Calgary | Province | AB |
| Postal Code | V0B 2G0 | Country | Canada | Postal Code | T1Y 7B5 | Country | Canada |
| Phone Number | 250-425-8202 | | | Phone Number | 1 403 407 1794 | | |

SAMPLE DETAILS

ANALYSIS REQUESTED

(Default: 0 Field, 1 Lab, 0 Field & Lab, 0 None)



L2272864-COFC

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-TU-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | Excel | PDF | EDD |
|---------------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|------------|---------------------|-----------------|---------------------|---------------|--------------|-------------------|-------------------|-------|-----|-----|
| RG_ERIMF_WS_20190513-0844 | RG_ERIMF | WS | No | 13-May-19 | 0844 | G | 7 | X | X | X | X | X | X | X | X | X | X |
| RG_ERIMF_WS_20190513-0844 FB-HG | RG_ERIMF | WS | No | 13-May-19 | 0844 | G | 1 | | | | X | | | | | | |

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION

DATE/TIME

ACCEPTED BY/AFFILIATION

For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labeled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample?

[Handwritten signatures and initials]

NB OF BOTTLES RETURNED/DESCRIPTION

| | |
|---|-------------------------------------|
| Regular (default) | <input checked="" type="checkbox"/> |
| Priority (2-3 business days) - 50% surcharge | <input type="checkbox"/> |
| Emergency (1 Business Day) - 100% surcharge | <input type="checkbox"/> |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | <input type="checkbox"/> |

Sampler's Name
Sampler's Signature

Mobile #
Date/Time

10



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 15-MAY-19
Report Date: 23-MAY-19 14:39 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2273883
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-12 - 2
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2273883-1 | L2273883-2 | L2273883-3 | L2273883-4 |
|-----------------------------|---|---------------------------------|------------------------------|--|------------------------------|--|
| | | Description | WS | WS | WS | WS |
| | | Sampled Date | 14-MAY-19 | 14-MAY-19 | 14-MAY-19 | 14-MAY-19 |
| | | Sampled Time | 09:40 | 09:40 | 13:15 | 13:15 |
| | | Client ID | RG_LNLK_WS_20 190514-0940 | RG_LNLK_WS_20 190514-0940 FB- HG | RG_GRLK_WS_20 190514-1315 | RG_GRLK_WS_20 190514-1315 FB- HG |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 251 | | 303 | |
| | Hardness (as CaCO3) (mg/L) | | 135 | | 180 | |
| | pH (pH) | | 8.23 | | 8.25 | |
| | ORP (mV) | | 486 | | 412 | |
| | Total Suspended Solids (mg/L) | | 1.4 | | 2.9 | |
| | Total Dissolved Solids (mg/L) | | 168 ^{DLHC} | | 178 ^{DLHC} | |
| | Turbidity (NTU) | | 1.19 | | 1.29 | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | <1.0 | | <1.0 | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 131 | | 149 | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | | <1.0 | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 131 | | 149 | |
| | Ammonia as N (mg/L) | | 0.0262 | | <0.0050 | |
| | Bromide (Br) (mg/L) | | <0.050 | | <0.050 | |
| | Chloride (Cl) (mg/L) | | 2.54 | | <0.50 | |
| | Fluoride (F) (mg/L) | | 0.060 | | 0.587 | |
| | Ion Balance (%) | | 105 | | 107 | |
| | Nitrate (as N) (mg/L) | | <0.0050 | | <0.0050 | |
| | Nitrite (as N) (mg/L) | | <0.0010 | | <0.0010 | |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.930 | | 0.204 | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | | 0.0013 | |
| | Phosphorus (P)-Total (mg/L) | | 0.0086 | | 0.0067 | |
| | Sulfate (SO4) (mg/L) | | 3.12 | | 20.8 | |
| | Anion Sum (meq/L) | | 2.76 | | 3.44 | |
| | Cation Sum (meq/L) | | 2.91 | | 3.70 | |
| | Cation - Anion Balance (%) | | 2.6 | | 3.5 | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 9.80 | | 2.47 |
| Total Organic Carbon (mg/L) | | | 10.1 | | 2.71 | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0062 | | 0.0071 | |
| | Antimony (Sb)-Total (mg/L) | | <0.00010 | | <0.00010 | |
| | Arsenic (As)-Total (mg/L) | | 0.00050 | | 0.00037 | |
| | Barium (Ba)-Total (mg/L) | | 0.200 | | 0.0553 | |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | |
| | Boron (B)-Total (mg/L) | | <0.010 | | <0.010 | |
| | Cadmium (Cd)-Total (ug/L) | | <0.0050 | | <0.0050 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2273883-1 WS 14-MAY-19 09:40 RG_LNLK_WS_20 190514-0940 | L2273883-2 WS 14-MAY-19 09:40 RG_LNLK_WS_20 190514-0940 FB- HG | L2273883-3 WS 14-MAY-19 13:15 RG_GRLK_WS_20 190514-1315 | L2273883-4 WS 14-MAY-19 13:15 RG_GRLK_WS_20 190514-1315 FB- HG |
|-------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | 26.8 | | 37.7 | |
| | Chromium (Cr)-Total (mg/L) | <0.00010 | | <0.00010 | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | | <0.10 | |
| | Copper (Cu)-Total (mg/L) | 0.00175 | | <0.00050 | |
| | Iron (Fe)-Total (mg/L) | <0.010 | | <0.010 | |
| | Lead (Pb)-Total (mg/L) | <0.000050 | | <0.000050 | |
| | Lithium (Li)-Total (mg/L) | 0.0016 | | 0.0031 | |
| | Magnesium (Mg)-Total (mg/L) | 16.1 | | 18.3 | |
| | Manganese (Mn)-Total (mg/L) | 0.00636 | | 0.00222 | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | 0.000348 | | 0.00133 | |
| | Nickel (Ni)-Total (mg/L) | <0.00050 | | <0.00050 | |
| | Potassium (K)-Total (mg/L) | 1.31 | | 1.04 | |
| | Selenium (Se)-Total (ug/L) | <0.050 | | 0.223 | |
| | Silicon (Si)-Total (mg/L) | 1.23 | | 2.37 | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | | <0.000010 | |
| | Sodium (Na)-Total (mg/L) | 4.13 | | 1.80 | |
| | Strontium (Sr)-Total (mg/L) | 0.0735 | | 0.128 | |
| | Thallium (Tl)-Total (mg/L) | <0.000010 | | <0.000010 | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | | <0.00010 | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | | <0.010 | |
| | Uranium (U)-Total (mg/L) | 0.000243 | | 0.000803 | |
| | Vanadium (V)-Total (mg/L) | <0.00050 | | <0.00050 | |
| | Zinc (Zn)-Total (mg/L) | <0.0030 | | <0.0030 | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | | LAB | |
| | Dissolved Metals Filtration Location | LAB | | LAB | |
| | Aluminum (Al)-Dissolved (mg/L) | <0.0030 | | <0.0030 | |
| | Antimony (Sb)-Dissolved (mg/L) | <0.00010 | | <0.00010 | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00053 | | 0.00039 | |
| | Barium (Ba)-Dissolved (mg/L) | 0.196 | | 0.0658 | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.020 | | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | <0.010 | | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | <0.0050 | | <0.0050 | |
| | Calcium (Ca)-Dissolved (mg/L) | 27.4 | | 39.5 | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | <0.00010 | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | L2273883-1 | L2273883-2 | L2273883-3 | L2273883-4 |
|-------------------------|----------------------------------|--|------------------------------|--|
| Description | WS | WS | WS | WS |
| Sampled Date | 14-MAY-19 | 14-MAY-19 | 14-MAY-19 | 14-MAY-19 |
| Sampled Time | 09:40 | 09:40 | 13:15 | 13:15 |
| Client ID | RG_LNLK_WS_20 190514-0940 | RG_LNLK_WS_20 190514-0940 FB- HG | RG_GRLK_WS_20 190514-1315 | RG_GRLK_WS_20 190514-1315 FB- HG |
| Grouping | Analyte | | | |
| WATER | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | <0.00050 | |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | <0.010 | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | |
| | Lithium (Li)-Dissolved (mg/L) | 0.0016 | 0.0031 | |
| | Magnesium (Mg)-Dissolved (mg/L) | 16.1 | 19.7 | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00017 | 0.00021 | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000414 | 0.00127 | |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | <0.00050 | |
| | Potassium (K)-Dissolved (mg/L) | 1.29 | 1.11 | |
| | Selenium (Se)-Dissolved (ug/L) | <0.050 | 0.290 | |
| | Silicon (Si)-Dissolved (mg/L) | 1.18 | 2.23 | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | |
| | Sodium (Na)-Dissolved (mg/L) | 4.19 | 1.76 | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.0764 | 0.137 | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | |
| | Uranium (U)-Dissolved (mg/L) | 0.000239 | 0.000859 | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | <0.0010 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2273883-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2273883-1 |
| Matrix Spike | Lithium (Li)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2273883-1 |
| Matrix Spike | Nickel (Ni)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Potassium (K)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Selenium (Se)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2273883-1 |
| Matrix Spike | Uranium (U)-Dissolved | MS-B | L2273883-3 |
| Matrix Spike | Aluminum (Al)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Manganese (Mn)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Selenium (Se)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Sodium (Na)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2273883-1, -3 |
| Matrix Spike | Ammonia as N | MS-B | L2273883-1, -3 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |

Reference Information

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et

Reference Information

al.

| | | | |
|---|-------|---|--------------------------|
| NO2-L-IC-N-CL | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-L-IC-N-CL | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| ORP-CL | Water | Oxidation reduction potential by elect. | ASTM D1498 |
| This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV. | | | |
| It is recommended that this analysis be conducted in the field. | | | |
| P-T-L-COL-CL | Water | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. | | | |
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-12 - 2

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2273883

Report Date: 23-MAY-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639655 | | | | | | | |
| WG3054174-6 | DUP | L2273883-3 | | | | | | |
| Acidity (as CaCO3) | | <1.0 | <1.0 | RPD-NA | mg/L | N/A | 20 | 17-MAY-19 |
| WG3054174-5 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 101.7 | | % | | 85-115 | 17-MAY-19 |
| WG3054174-4 | MB | | | | | | | |
| Acidity (as CaCO3) | | | 1.2 | | mg/L | | 2 | 17-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639705 | | | | | | | |
| WG3054620-2 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 100.6 | | % | | 85-115 | 21-MAY-19 |
| WG3054620-1 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 21-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639409 | | | | | | | |
| WG3052556-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 92.7 | | % | | 80-120 | 18-MAY-19 |
| WG3052556-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 18-MAY-19 |
| Batch | R4639546 | | | | | | | |
| WG3053722-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 96.7 | | % | | 80-120 | 19-MAY-19 |
| WG3053722-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 19-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 99.7 | | % | | 80-120 | 17-MAY-19 |
| WG3052239-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 17-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 | LCS | | | | | | | |
| Bromide (Br) | | | 100.9 | | % | | 85-115 | 15-MAY-19 |
| WG3051370-13 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 15-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2273883

Report Date: 23-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|------------|-----------|------------|-----------|-------|-----|----------|-----------|
| C-DIS-ORG-LOW-CL Water | | | | | | | | |
| Batch | R4640468 | | | | | | | |
| WG3055624-6 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 108.3 | | % | | 80-120 | 21-MAY-19 |
| WG3055624-5 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 21-MAY-19 |
| C-TOT-ORG-LOW-CL Water | | | | | | | | |
| Batch | R4640468 | | | | | | | |
| WG3055624-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 111.4 | | % | | 80-120 | 21-MAY-19 |
| WG3055624-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 21-MAY-19 |
| CL-IC-N-CL Water | | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 | LCS | | | | | | | |
| Chloride (Cl) | | | 98.7 | | % | | 90-110 | 15-MAY-19 |
| WG3051370-13 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 15-MAY-19 |
| EC-L-PCT-CL Water | | | | | | | | |
| Batch | R4639705 | | | | | | | |
| WG3054620-2 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 103.3 | | % | | 90-110 | 21-MAY-19 |
| WG3054620-1 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 21-MAY-19 |
| F-IC-N-CL Water | | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 | LCS | | | | | | | |
| Fluoride (F) | | | 102.4 | | % | | 90-110 | 15-MAY-19 |
| WG3051370-13 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 15-MAY-19 |
| HG-D-CVAA-VA Water | | | | | | | | |
| Batch | R4639533 | | | | | | | |
| WG3054471-6 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 98.0 | | % | | 80-120 | 21-MAY-19 |
| WG3054696-2 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 100.6 | | % | | 80-120 | 21-MAY-19 |
| WG3054471-5 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 21-MAY-19 |
| WG3054696-1 | MB | | | | | | | |



Quality Control Report

Workorder: L2273883

Report Date: 23-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|--------|-----------|------------|-----------|-------|-----|----------|-----------|
| HG-D-CVAA-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R4639533 | | | | | | | | |
| WG3054696-1 MB | | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 21-MAY-19 |
| HG-T-U-CVAF-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R4640518 | | | | | | | | |
| WG3055680-2 LCS | | | | | | | | |
| Mercury (Hg)-Total | | | 89.2 | | % | | 80-120 | 22-MAY-19 |
| WG3055680-1 MB | | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 22-MAY-19 |
| MET-D-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R4639409 | | | | | | | | |
| WG3052556-2 LCS | | | | | | | | |
| Aluminum (Al)-Dissolved | | | 98.4 | | % | | 80-120 | 18-MAY-19 |
| Antimony (Sb)-Dissolved | | | 101.1 | | % | | 80-120 | 18-MAY-19 |
| Arsenic (As)-Dissolved | | | 100.6 | | % | | 80-120 | 18-MAY-19 |
| Barium (Ba)-Dissolved | | | 110.5 | | % | | 80-120 | 18-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 100.7 | | % | | 80-120 | 18-MAY-19 |
| Boron (B)-Dissolved | | | 94.8 | | % | | 80-120 | 18-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 100.0 | | % | | 80-120 | 18-MAY-19 |
| Calcium (Ca)-Dissolved | | | 99.7 | | % | | 80-120 | 18-MAY-19 |
| Chromium (Cr)-Dissolved | | | 102.5 | | % | | 80-120 | 18-MAY-19 |
| Cobalt (Co)-Dissolved | | | 99.7 | | % | | 80-120 | 18-MAY-19 |
| Copper (Cu)-Dissolved | | | 99.4 | | % | | 80-120 | 18-MAY-19 |
| Iron (Fe)-Dissolved | | | 92.3 | | % | | 80-120 | 18-MAY-19 |
| Lead (Pb)-Dissolved | | | 99.6 | | % | | 80-120 | 18-MAY-19 |
| Lithium (Li)-Dissolved | | | 93.0 | | % | | 80-120 | 18-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 102.6 | | % | | 80-120 | 18-MAY-19 |
| Manganese (Mn)-Dissolved | | | 104.3 | | % | | 80-120 | 18-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 102.3 | | % | | 80-120 | 18-MAY-19 |
| Nickel (Ni)-Dissolved | | | 98.3 | | % | | 80-120 | 18-MAY-19 |
| Potassium (K)-Dissolved | | | 99.9 | | % | | 80-120 | 18-MAY-19 |
| Selenium (Se)-Dissolved | | | 98.6 | | % | | 80-120 | 18-MAY-19 |
| Silicon (Si)-Dissolved | | | 96.1 | | % | | 60-140 | 18-MAY-19 |
| Silver (Ag)-Dissolved | | | 101.8 | | % | | 80-120 | 18-MAY-19 |
| Sodium (Na)-Dissolved | | | 95.1 | | % | | 80-120 | 18-MAY-19 |
| Strontium (Sr)-Dissolved | | | 101.3 | | % | | 80-120 | 18-MAY-19 |



Quality Control Report

Workorder: L2273883

Report Date: 23-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639409 | | | | | | | |
| WG3052556-2 | LCS | | | | | | | |
| Thallium (Tl)-Dissolved | | | 99.3 | | % | | 80-120 | 18-MAY-19 |
| Tin (Sn)-Dissolved | | | 100.8 | | % | | 80-120 | 18-MAY-19 |
| Titanium (Ti)-Dissolved | | | 96.6 | | % | | 80-120 | 18-MAY-19 |
| Uranium (U)-Dissolved | | | 101.0 | | % | | 80-120 | 18-MAY-19 |
| Vanadium (V)-Dissolved | | | 100.4 | | % | | 80-120 | 18-MAY-19 |
| Zinc (Zn)-Dissolved | | | 98.8 | | % | | 80-120 | 18-MAY-19 |
| WG3052556-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 18-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 18-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 18-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 18-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 18-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 18-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 18-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 18-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 18-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 18-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 18-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639409 | | | | | | | |
| WG3052556-1 | MB | LF | | | | | | |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 18-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 18-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 18-MAY-19 |
| Batch | R4639546 | | | | | | | |
| WG3053722-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 100.5 | | % | | 80-120 | 19-MAY-19 |
| Antimony (Sb)-Dissolved | | | 97.9 | | % | | 80-120 | 19-MAY-19 |
| Arsenic (As)-Dissolved | | | 99.5 | | % | | 80-120 | 19-MAY-19 |
| Barium (Ba)-Dissolved | | | 97.6 | | % | | 80-120 | 19-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 94.5 | | % | | 80-120 | 19-MAY-19 |
| Boron (B)-Dissolved | | | 97.4 | | % | | 80-120 | 19-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 96.6 | | % | | 80-120 | 19-MAY-19 |
| Calcium (Ca)-Dissolved | | | 96.6 | | % | | 80-120 | 19-MAY-19 |
| Chromium (Cr)-Dissolved | | | 99.9 | | % | | 80-120 | 19-MAY-19 |
| Cobalt (Co)-Dissolved | | | 97.0 | | % | | 80-120 | 19-MAY-19 |
| Copper (Cu)-Dissolved | | | 98.2 | | % | | 80-120 | 19-MAY-19 |
| Iron (Fe)-Dissolved | | | 95.1 | | % | | 80-120 | 19-MAY-19 |
| Lead (Pb)-Dissolved | | | 95.6 | | % | | 80-120 | 19-MAY-19 |
| Lithium (Li)-Dissolved | | | 93.6 | | % | | 80-120 | 19-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 102.1 | | % | | 80-120 | 19-MAY-19 |
| Manganese (Mn)-Dissolved | | | 102.0 | | % | | 80-120 | 19-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 102.0 | | % | | 80-120 | 19-MAY-19 |
| Nickel (Ni)-Dissolved | | | 99.0 | | % | | 80-120 | 19-MAY-19 |
| Potassium (K)-Dissolved | | | 103.4 | | % | | 80-120 | 19-MAY-19 |
| Selenium (Se)-Dissolved | | | 96.2 | | % | | 80-120 | 19-MAY-19 |
| Silicon (Si)-Dissolved | | | 95.6 | | % | | 60-140 | 19-MAY-19 |
| Silver (Ag)-Dissolved | | | 92.6 | | % | | 80-120 | 19-MAY-19 |
| Sodium (Na)-Dissolved | | | 101.4 | | % | | 80-120 | 19-MAY-19 |
| Strontium (Sr)-Dissolved | | | 96.2 | | % | | 80-120 | 19-MAY-19 |
| Thallium (Tl)-Dissolved | | | 95.5 | | % | | 80-120 | 19-MAY-19 |
| Tin (Sn)-Dissolved | | | 97.4 | | % | | 80-120 | 19-MAY-19 |
| Titanium (Ti)-Dissolved | | | 101.7 | | % | | 80-120 | 19-MAY-19 |
| Uranium (U)-Dissolved | | | 92.6 | | % | | 80-120 | 19-MAY-19 |
| Vanadium (V)-Dissolved | | | 99.9 | | % | | 80-120 | 19-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4639546 | | | | | | | |
| WG3053722-2 | LCS | | | | | | | |
| Zinc (Zn)-Dissolved | | | 93.9 | | % | | 80-120 | 19-MAY-19 |
| WG3053722-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 19-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 19-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 19-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 19-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 19-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 19-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 19-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 19-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 19-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 19-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 19-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 19-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 19-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 19-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 19-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 19-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 19-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 19-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 19-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 19-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 19-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 19-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 19-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 19-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|----------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 104.2 | | % | | 80-120 | 17-MAY-19 |
| Antimony (Sb)-Total | | | 100.4 | | % | | 80-120 | 17-MAY-19 |
| Arsenic (As)-Total | | | 96.6 | | % | | 80-120 | 17-MAY-19 |
| Barium (Ba)-Total | | | 92.9 | | % | | 80-120 | 17-MAY-19 |
| Bismuth (Bi)-Total | | | 109.0 | | % | | 80-120 | 17-MAY-19 |
| Boron (B)-Total | | | 97.2 | | % | | 80-120 | 17-MAY-19 |
| Cadmium (Cd)-Total | | | 97.5 | | % | | 80-120 | 17-MAY-19 |
| Calcium (Ca)-Total | | | 103.9 | | % | | 80-120 | 17-MAY-19 |
| Chromium (Cr)-Total | | | 99.8 | | % | | 80-120 | 17-MAY-19 |
| Cobalt (Co)-Total | | | 98.0 | | % | | 80-120 | 17-MAY-19 |
| Copper (Cu)-Total | | | 96.2 | | % | | 80-120 | 17-MAY-19 |
| Iron (Fe)-Total | | | 97.5 | | % | | 80-120 | 17-MAY-19 |
| Lead (Pb)-Total | | | 103.7 | | % | | 80-120 | 17-MAY-19 |
| Lithium (Li)-Total | | | 99.0 | | % | | 80-120 | 17-MAY-19 |
| Magnesium (Mg)-Total | | | 102.7 | | % | | 80-120 | 17-MAY-19 |
| Manganese (Mn)-Total | | | 96.4 | | % | | 80-120 | 17-MAY-19 |
| Molybdenum (Mo)-Total | | | 102.4 | | % | | 80-120 | 17-MAY-19 |
| Nickel (Ni)-Total | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| Potassium (K)-Total | | | 102.1 | | % | | 80-120 | 17-MAY-19 |
| Selenium (Se)-Total | | | 96.3 | | % | | 80-120 | 17-MAY-19 |
| Silicon (Si)-Total | | | 97.9 | | % | | 80-120 | 17-MAY-19 |
| Silver (Ag)-Total | | | 98.2 | | % | | 80-120 | 17-MAY-19 |
| Sodium (Na)-Total | | | 104.7 | | % | | 80-120 | 17-MAY-19 |
| Strontium (Sr)-Total | | | 99.2 | | % | | 80-120 | 17-MAY-19 |
| Thallium (Tl)-Total | | | 102.5 | | % | | 80-120 | 17-MAY-19 |
| Tin (Sn)-Total | | | 97.6 | | % | | 80-120 | 17-MAY-19 |
| Titanium (Ti)-Total | | | 99.4 | | % | | 80-120 | 17-MAY-19 |
| Uranium (U)-Total | | | 96.8 | | % | | 80-120 | 17-MAY-19 |
| Vanadium (V)-Total | | | 100.3 | | % | | 80-120 | 17-MAY-19 |
| Zinc (Zn)-Total | | | 98.0 | | % | | 80-120 | 17-MAY-19 |
| WG3052239-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 17-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4637588 | | | | | | | |
| WG3052239-1 | MB | | | | | | | |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 17-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 17-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 17-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 17-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 17-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 17-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 17-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 17-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 17-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 17-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 17-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 17-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 17-MAY-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4641366 | | | | | | | |
| WG3055338-14 | LCS | | | | | | | |
| Ammonia as N | | | 89.7 | | % | | 85-115 | 22-MAY-19 |
| WG3055338-13 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 22-MAY-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------------|-------------------|---------|-----------|-------|-----|---------|-----------|
| NO2-L-IC-N-CL | Water | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 LCS | | | | | | | | |
| Nitrite (as N) | | | 102.3 | | % | | 90-110 | 15-MAY-19 |
| WG3051370-13 MB | | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 15-MAY-19 |
| NO3-L-IC-N-CL | Water | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 LCS | | | | | | | | |
| Nitrate (as N) | | | 96.5 | | % | | 90-110 | 15-MAY-19 |
| WG3051370-13 MB | | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 15-MAY-19 |
| ORP-CL | Water | | | | | | | |
| Batch | R4640112 | | | | | | | |
| WG3055212-9 CRM | | CL-ORP | | | | | | |
| ORP | | | 225 | | mV | | 210-230 | 21-MAY-19 |
| P-T-L-COL-CL | Water | | | | | | | |
| Batch | R4640587 | | | | | | | |
| WG3055773-4 LCS | | | | | | | | |
| Phosphorus (P)-Total | | | 102.9 | | % | | 80-120 | 22-MAY-19 |
| WG3055773-3 MB | | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 22-MAY-19 |
| PH-CL | Water | | | | | | | |
| Batch | R4639705 | | | | | | | |
| WG3054620-2 LCS | | | | | | | | |
| pH | | | 7.01 | | pH | | 6.9-7.1 | 21-MAY-19 |
| PO4-DO-L-COL-CL | Water | | | | | | | |
| Batch | R4635484 | | | | | | | |
| WG3050462-34 LCS | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 104.4 | | % | | 80-120 | 15-MAY-19 |
| WG3050462-38 LCS | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 107.5 | | % | | 80-120 | 15-MAY-19 |
| WG3050462-33 MB | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 15-MAY-19 |
| WG3050462-37 MB | | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 15-MAY-19 |
| WG3050462-35 MS | | L2273883-3 | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| PO4-DO-L-COL-CL | Water | | | | | | | |
| Batch | R4635484 | | | | | | | |
| WG3050462-35 MS | | L2273883-3 | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 93.3 | | % | | 70-130 | 15-MAY-19 |
| SO4-IC-N-CL | Water | | | | | | | |
| Batch | R4636190 | | | | | | | |
| WG3051370-14 LCS | | | | | | | | |
| Sulfate (SO4) | | | 98.0 | | % | | 90-110 | 15-MAY-19 |
| WG3051370-13 MB | | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 15-MAY-19 |
| SOLIDS-TDS-CL | Water | | | | | | | |
| Batch | R4640638 | | | | | | | |
| WG3054269-14 LCS | | | | | | | | |
| Total Dissolved Solids | | | 94.6 | | % | | 85-115 | 21-MAY-19 |
| WG3054269-13 MB | | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 21-MAY-19 |
| TKN-L-F-CL | Water | | | | | | | |
| Batch | R4640402 | | | | | | | |
| WG3055467-10 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.7 | | % | | 75-125 | 22-MAY-19 |
| WG3055467-12 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.9 | | % | | 75-125 | 22-MAY-19 |
| WG3055467-15 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 94.4 | | % | | 75-125 | 22-MAY-19 |
| WG3055467-2 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.6 | | % | | 75-125 | 22-MAY-19 |
| WG3055467-6 LCS | | | | | | | | |
| Total Kjeldahl Nitrogen | | | 93.5 | | % | | 75-125 | 22-MAY-19 |
| WG3055467-1 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| WG3055467-11 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| WG3055467-14 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| WG3055467-5 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| WG3055467-9 MB | | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| TSS-L-CL | Water | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|--------------|-----------|--------|-----------|-------|-----|--------|-----------|
| TSS-L-CL | Water | | | | | | | |
| Batch | R4640398 | | | | | | | |
| WG3054786-10 | LCS | | | | | | | |
| Total Suspended Solids | | | 96.4 | | % | | 85-115 | 21-MAY-19 |
| WG3054786-9 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 21-MAY-19 |
| TURBIDITY-CL | Water | | | | | | | |
| Batch | R4636984 | | | | | | | |
| WG3051917-2 | LCS | | | | | | | |
| Turbidity | | | 96.5 | | % | | 85-115 | 16-MAY-19 |
| WG3051917-1 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 16-MAY-19 |

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | 1 | 14-MAY-19 09:40 | 21-MAY-19 12:55 | 0.25 | 171 | hours | EHTR-FM |
| | 3 | 14-MAY-19 13:15 | 21-MAY-19 12:55 | 0.25 | 168 | hours | EHTR-FM |
| pH | 1 | 14-MAY-19 09:40 | 21-MAY-19 09:00 | 0.25 | 167 | hours | EHTR-FM |
| | 3 | 14-MAY-19 13:15 | 21-MAY-19 09:00 | 0.25 | 164 | hours | EHTR-FM |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2273883 were received on 15-MAY-19 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

COC ID: REP-Lentic 19-12 - 2

TURNAROUND TIME:

| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
|----------------------|--------------------------------|-----------|--------|---------------|-------------------------------|-----------|--------|
| Facility Name / Job: | Regional Effects Program (REP) | | | Lab Name: | ALS Calgary | | |
| Project Manager: | Cait Good | | | Lab Contact: | Lyudmyla Shvets | | |
| Email: | cait.good@teck.com | | | Email: | lyudmyla.shvets@alsglobal.com | | |
| Address: | 421 Pine Avenue | | | Address: | 3539 29 Street NE | | |
| City: | Sparwood | Province: | BC | City: | Calgary | Province: | AB |
| Postal Code: | V0H 2G0 | Country: | Canada | Postal Code: | T1Y 7B5 | Country: | Canada |
| Phone Number: | 250-425-8202 | | | Phone Number: | 1-403-407-1794 | | |

| | Excel | PDF | EDD |
|-------------------------------|-------|-----|-----|
| cait.good@teck.com | X | X | X |
| teck.ca@alsglobal.com | X | X | X |
| lyudmyla.shvets@alsglobal.com | X | X | X |

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered - F, Field, L, Lab, FL, Field & Lab, N, None



L2273883-COFC

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | IG-TU-CVAF-VA | IG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA |
|--------------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|------------|---------------------|-----------------|---------------------|---------------|--------------|-------------------|-------------------|
| RG_LNLK_WS_20190514-0940 | RG_LNLK | WS | No | 14-May-19 | 0940 | G | 7 | X | X | X | X | X | X | X |
| RG_LNLK_WS_20190514-0940 FR-IG | RG_LNLK | WS | No | 14-May-19 | 0940 | G | 1 | | | | X | | | |
| RG_GRLK_WS_20190514-1315 | RG_GRLK | WS | No | 14-May-19 | 1315 | G | 7 | X | X | X | X | X | X | X |
| RG_GRLK_WS_20190514-1315 FR-IG | RG_GRLK | WS | No | 14-May-19 | 1315 | G | 1 | | | | X | | | |

| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | RELINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
|---|-----------------------------|-----------|-----------------------------|
| For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample? | | | <i>[Signature]</i> 5/15 908 |
| NB OF BOTTLES RETURNED/DESCRIPTION | Sampler's Name | Mobile # | |
| Regular (default) x | Sampler's Signature | Date/Time | |
| Priority (2-3 business days) - 50% surcharge | | | |
| Emergency (1 Business Day) - 100% surcharge | | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | | |

7



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 22-MAY-19
Report Date: 31-MAY-19 15:06 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2277038
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM (REP)
C of C Numbers: 19-12-5
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | | L2277038-1 WS 21-MAY-19 09:00 RG_GRLK_WS_20 190521-0900 | L2277038-2 WS 21-MAY-19 09:00 RG_GRLK_WS_20 190521-0900 FB- HG | L2277038-3 WS 21-MAY-19 09:33 RG_GC_WS_2019 0521-0933 | L2277038-4 WS 21-MAY-19 09:33 RG_GC_WS_2019 0521-0933 FB-HG | L2277038-5 WS 21-MAY-19 10:26 RG_FBLANK_WS_ 20190521-1026 |
|---|---|--|--|--|--|--|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 307 | | 177 | | <2.0 |
| | Hardness (as CaCO3) (mg/L) | 166 | | 85.2 | | <0.50 |
| | pH (pH) | 8.32 | | 8.09 | | 5.33 |
| | ORP (mV) | 420 | | 399 | | 434 |
| | Total Suspended Solids (mg/L) | <1.0 | | 3.4 | | <1.0 |
| | Total Dissolved Solids (mg/L) | 171 ^{DLHC} | | 101 ^{DLHC} | | <10 |
| | Turbidity (NTU) | 0.31 | | 4.35 | | 0.24 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | <1.0 | | 1.5 | | 1.6 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 149 | | 86.4 | | <1.0 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | 1.2 | | <1.0 | | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | 150 | | 86.4 | | <1.0 |
| | Ammonia as N (mg/L) | <0.0050 | | <0.0050 | | <0.0050 |
| | Bromide (Br) (mg/L) | <0.050 | | <0.050 | | <0.050 |
| | Chloride (Cl) (mg/L) | 0.52 | | 0.76 | | <0.50 |
| | Fluoride (F) (mg/L) | 0.617 | | 0.055 | | <0.020 |
| | Ion Balance (%) | 97.9 | | 94.7 | | 0.0 |
| | Nitrate (as N) (mg/L) | <0.0050 | | 0.185 | | <0.0050 |
| | Nitrite (as N) (mg/L) | <0.0010 | | <0.0010 | | <0.0010 |
| | Total Kjeldahl Nitrogen (mg/L) | 0.223 | | 0.082 | | <0.050 |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | 0.0019 | | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | 0.0060 | | 0.0090 | | <0.0020 |
| | Sulfate (SO4) (mg/L) | 21.6 | | 6.38 | | <0.30 |
| | Anion Sum (meq/L) | 3.49 | | 1.90 | | <0.10 |
| | Cation Sum (meq/L) | 3.42 | | 1.80 | | <0.10 |
| | Cation - Anion Balance (%) | -1.1 | | -2.7 | | 0.0 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 2.10 | | 2.49 | |
| Total Organic Carbon (mg/L) | | 2.12 | | 2.57 | | <0.50 |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0052 | | 0.117 | | <0.0030 |
| | Antimony (Sb)-Total (mg/L) | <0.00010 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Total (mg/L) | 0.00037 | | 0.00027 | | <0.00010 |
| | Barium (Ba)-Total (mg/L) | 0.0510 | | 0.0426 | | 0.00029 ^{RRV} |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Total (mg/L) | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | <0.0050 | | 0.0052 | | <0.0050 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-6 | L2277038-7 | L2277038-8 | L2277038-9 | L2277038-10 |
|-----------------------------|---|---------------------------------|------------------------------|----------------------------|----------------------------------|-----------------------------|-----------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 10:26 | 10:26 | 10:26 | 10:26 | 10:26 |
| | | Client ID | RG_TRIP_WS_201 90521-1026 | RG_ER_WS_2019 0521-1026 | RG_ER_WS_2019 0521-1026 FB-HG | RG_DUP_WS_201 90521-1026 | RG_DUP_WS_201 90521-1026 FB-HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | <2.0 | 304 | | 253 | |
| | Hardness (as CaCO3) (mg/L) | | <0.50 | 128 | | 120 | |
| | pH (pH) | | 5.29 | 8.23 | | 8.16 | |
| | ORP (mV) | | 432 | 442 | | 425 | |
| | Total Suspended Solids (mg/L) | | <1.0 | 23.4 | | 19.3 | |
| | Total Dissolved Solids (mg/L) | | <10 | 165 | DLHC | 134 | DLHC |
| | Turbidity (NTU) | | <0.10 | 17.3 | | 11.9 | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 1.5 | <1.0 | | 1.2 | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | <1.0 | 142 | | 115 | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | <1.0 | | <1.0 | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | <1.0 | | <1.0 | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | <1.0 | 142 | | 115 | |
| | Ammonia as N (mg/L) | | <0.0050 | <0.0050 | | 0.0063 | |
| | Bromide (Br) (mg/L) | | <0.050 | <0.050 | | <0.050 | |
| | Chloride (Cl) (mg/L) | | <0.50 | 3.18 | | 2.23 | |
| | Fluoride (F) (mg/L) | | <0.020 | 0.091 | | 0.082 | |
| | Ion Balance (%) | | 0.0 | 83.4 | | 93.4 | |
| | Nitrate (as N) (mg/L) | | <0.0050 | 0.269 | | 0.316 | |
| | Nitrite (as N) (mg/L) | | <0.0010 | <0.0010 | | <0.0010 | |
| | Total Kjeldahl Nitrogen (mg/L) | | <0.050 | 0.118 | | 0.101 | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | 0.0070 | | 0.0035 | |
| | Phosphorus (P)-Total (mg/L) | | <0.0020 | 0.0199 | | 0.0272 | |
| | Sulfate (SO4) (mg/L) | | <0.30 | 16.5 | | 17.9 | |
| | Anion Sum (meq/L) | | <0.10 | 3.29 | | 2.75 | |
| | Cation Sum (meq/L) | | <0.10 | 2.74 | | 2.57 | |
| | Cation - Anion Balance (%) | | 0.0 | -9.0 | | -3.4 | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | | 1.95 | | 1.92 |
| Total Organic Carbon (mg/L) | | | <0.50 | 2.25 | | 2.17 | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | <0.0030 | 0.273 | | 0.452 | |
| | Antimony (Sb)-Total (mg/L) | | <0.00010 | <0.00010 | | <0.00010 | |
| | Arsenic (As)-Total (mg/L) | | <0.00010 | 0.00055 | | 0.00058 | |
| | Barium (Ba)-Total (mg/L) | | <0.00010 | 0.0542 | | 0.0514 | |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | <0.020 | | 0.025 | |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | <0.000050 | | <0.000050 | |
| | Boron (B)-Total (mg/L) | | <0.010 | <0.010 | | <0.010 | |
| | Cadmium (Cd)-Total (ug/L) | | <0.0050 | 0.0127 | | 0.0131 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-11 | L2277038-12 | L2277038-13 | L2277038-14 | L2277038-15 |
|-----------------------------|---|---------------------------------|------------------------------|--|-------------------------------|---|-------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 14:17 | 14:17 | 13:00 | 13:00 | 15:15 |
| | | Client ID | RG_STPD_WS_20 190521-1417 | RG_STPD_WS_20 190521-1417 FB- HG | RG_ERIMF_WS_2 0190521-1300 | RG_ERIMF_WS_2 0190521-1300 FB- HG | RG_ERWSF_WS_ 20190521-1515 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 427 | | 358 | | 594 |
| | Hardness (as CaCO3) (mg/L) | | 212 | | 160 | | 272 |
| | pH (pH) | | 8.21 | | 8.25 | | 8.26 |
| | ORP (mV) | | 402 | | 413 | | 447 |
| | Total Suspended Solids (mg/L) | | <1.0 | | 2.1 | | 2.5 |
| | Total Dissolved Solids (mg/L) | | 237 ^{DLHC} | | 177 ^{DLHC} | | 321 ^{DLHC} |
| | Turbidity (NTU) | | 0.88 | | 2.82 | | 3.12 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 1.7 | | <1.0 | | <1.0 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 161 | | 166 | | 257 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | | <1.0 | | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 161 | | 166 | | 257 |
| | Ammonia as N (mg/L) | | 0.0135 | | <0.0050 | | 0.0092 |
| | Bromide (Br) (mg/L) | | <0.050 | | <0.050 | | <0.050 |
| | Chloride (Cl) (mg/L) | | 3.03 | | 9.82 | | 32.9 |
| | Fluoride (F) (mg/L) | | 0.165 | | 0.096 | | 0.095 |
| | Ion Balance (%) | | 96.5 | | 95.5 | | 98.9 |
| | Nitrate (as N) (mg/L) | | 0.868 | | <0.0050 | | 0.410 |
| | Nitrite (as N) (mg/L) | | 0.0041 | | <0.0010 | | 0.0013 |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.174 | | 0.156 | | 0.284 |
| | Orthophosphate-Dissolved (as P) (mg/L) | | 0.0010 | | <0.0010 | | 0.0015 |
| | Phosphorus (P)-Total (mg/L) | | 0.0072 | | 0.0129 | | 0.0210 |
| | Sulfate (SO4) (mg/L) | | 56.8 | | 6.41 | | 11.6 |
| | Anion Sum (meq/L) | | 4.56 | | 3.73 | | 6.35 |
| | Cation Sum (meq/L) | | 4.40 | | 3.56 | | 6.28 |
| | Cation - Anion Balance (%) | | -1.8 | | -2.3 | | -0.6 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 1.10 | | 2.69 | |
| Total Organic Carbon (mg/L) | | | 0.84 | | 2.39 | | 2.80 |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0035 | | 0.0307 | | 0.114 |
| | Antimony (Sb)-Total (mg/L) | | <0.00010 | | 0.00022 | | 0.00015 |
| | Arsenic (As)-Total (mg/L) | | 0.00014 | | 0.00038 | | 0.00042 |
| | Barium (Ba)-Total (mg/L) | | 0.0983 | | 0.127 | | 0.0890 |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Total (mg/L) | | <0.010 | | <0.010 | | 0.016 |
| | Cadmium (Cd)-Total (ug/L) | | 0.0084 | | 0.0079 | | 0.0202 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2277038-16 | | | |
|-----------------------------------|---|---------------------------|--|--|--|
| | | WS | | | |
| | | 21-MAY-19 | | | |
| | | 15:15 | | | |
| | | RG_ERWSF_WS_20190521-1515 | | | |
| | | FB-HG | | | |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) Hardness (as CaCO3) (mg/L) pH (pH) ORP (mV) Total Suspended Solids (mg/L) Total Dissolved Solids (mg/L) Turbidity (NTU) | | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) Alkalinity, Bicarbonate (as CaCO3) (mg/L) Alkalinity, Carbonate (as CaCO3) (mg/L) Alkalinity, Hydroxide (as CaCO3) (mg/L) Alkalinity, Total (as CaCO3) (mg/L) Ammonia as N (mg/L) Bromide (Br) (mg/L) Chloride (Cl) (mg/L) Fluoride (F) (mg/L) Ion Balance (%) Nitrate (as N) (mg/L) Nitrite (as N) (mg/L) Total Kjeldahl Nitrogen (mg/L) Orthophosphate-Dissolved (as P) (mg/L) Phosphorus (P)-Total (mg/L) Sulfate (SO4) (mg/L) Anion Sum (meq/L) Cation Sum (meq/L) Cation - Anion Balance (%) | | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) Total Organic Carbon (mg/L) | | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) Antimony (Sb)-Total (mg/L) Arsenic (As)-Total (mg/L) Barium (Ba)-Total (mg/L) Beryllium (Be)-Total (ug/L) Bismuth (Bi)-Total (mg/L) Boron (B)-Total (mg/L) Cadmium (Cd)-Total (ug/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-1 | L2277038-2 | L2277038-3 | L2277038-4 | L2277038-5 |
|-------------------------|---------------------------------------|--------------|------------------------------|--|----------------------------|----------------------------------|--------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 09:00 | 09:00 | 09:33 | 09:33 | 10:26 |
| | | Client ID | RG_GRLK_WS_20 190521-0900 | RG_GRLK_WS_20 190521-0900 FB- HG | RG_GC_WS_2019 0521-0933 | RG_GC_WS_2019 0521-0933 FB-HG | RG_FBLANK_WS_ 20190521-1026 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 36.2 | | 23.3 | | <0.050 |
| | Chromium (Cr)-Total (mg/L) | | <0.00010 | | 0.00017 | | <0.00010 |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | | <0.10 | | <0.10 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | | 0.00072 | | <0.00050 |
| | Iron (Fe)-Total (mg/L) | | <0.010 | | 0.103 | | <0.010 |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | | 0.000111 | | <0.000050 |
| | Lithium (Li)-Total (mg/L) | | 0.0035 | | 0.0011 | | <0.0010 |
| | Magnesium (Mg)-Total (mg/L) | | 18.0 | | 7.39 | | <0.10 |
| | Manganese (Mn)-Total (mg/L) | | 0.00263 | | 0.00554 | | <0.00010 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | 0.00122 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.00124 | | 0.000245 | | <0.000050 |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Total (mg/L) | | 1.01 | | 0.571 | | <0.050 |
| | Selenium (Se)-Total (ug/L) | | 0.301 | | 0.313 | | <0.050 |
| | Silicon (Si)-Total (mg/L) | | 2.75 | | 4.32 | | <0.10 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 1.87 | | 1.87 | | <0.050 |
| | Strontium (Sr)-Total (mg/L) | | 0.129 | | 0.0536 | | <0.00020 |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.000814 | | 0.000456 | | <0.000010 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | | <0.0030 | | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | | LAB |
| | Dissolved Metals Filtration Location | | LAB | | LAB | | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | <0.0030 | | 0.0142 | | <0.0030 |
| | Antimony (Sb)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00033 | | 0.00022 | | <0.00010 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0599 | | 0.0483 | | <0.00010 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | <0.0050 | | <0.0050 | | <0.0050 |
| | Calcium (Ca)-Dissolved (mg/L) | | 35.6 | | 22.5 | | <0.050 |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-6 | L2277038-7 | L2277038-8 | L2277038-9 | L2277038-10 |
|-------------------------|---------------------------------------|--------------|------------------------------|----------------------------|----------------------------------|-----------------------------|-----------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 10:26 | 10:26 | 10:26 | 10:26 | 10:26 |
| | | Client ID | RG_TRIP_WS_201 90521-1026 | RG_ER_WS_2019 0521-1026 | RG_ER_WS_2019 0521-1026 FB-HG | RG_DUP_WS_201 90521-1026 | RG_DUP_WS_201 90521-1026 FB-HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | <0.050 | 34.9 | | 34.2 | |
| | Chromium (Cr)-Total (mg/L) | | <0.00010 | 0.00042 | | 0.00066 | |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | 0.20 | | 0.31 | |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | 0.00097 | | 0.00121 | |
| | Iron (Fe)-Total (mg/L) | | <0.010 | 0.314 | | 0.563 | |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | 0.000376 | | 0.000623 | |
| | Lithium (Li)-Total (mg/L) | | <0.0010 | 0.0024 | | 0.0025 | |
| | Magnesium (Mg)-Total (mg/L) | | <0.10 | 12.5 | | 11.8 | |
| | Manganese (Mn)-Total (mg/L) | | <0.00010 | 0.0145 | | 0.0219 | |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | 0.00101 | <0.00050 | 0.00147 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | <0.000050 | 0.000568 | | 0.000512 | |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | <0.00050 | | 0.00073 | |
| | Potassium (K)-Total (mg/L) | | <0.050 | 0.887 | | 0.832 | |
| | Selenium (Se)-Total (ug/L) | | <0.050 | 0.955 | | 0.988 | |
| | Silicon (Si)-Total (mg/L) | | <0.10 | 3.53 | | 3.55 | |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | <0.000010 | | <0.000010 | |
| | Sodium (Na)-Total (mg/L) | | <0.050 | 3.97 | | 3.36 | |
| | Strontium (Sr)-Total (mg/L) | | <0.00020 | 0.121 | | 0.118 | |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | <0.000010 | | <0.000010 | |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | <0.00010 | | <0.00010 | |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | <0.010 | | <0.010 | |
| | Uranium (U)-Total (mg/L) | | <0.000010 | 0.00100 | | 0.000925 | |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | 0.00071 | | 0.00090 | |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | 0.0045 | | 0.0046 | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | LAB | | LAB | |
| | Dissolved Metals Filtration Location | | LAB | LAB | | LAB | |
| | Aluminum (Al)-Dissolved (mg/L) | | | 0.0100 | | 0.0103 | |
| | Antimony (Sb)-Dissolved (mg/L) | | | <0.00010 | | <0.00010 | |
| | Arsenic (As)-Dissolved (mg/L) | | | 0.00040 | | 0.00040 | |
| | Barium (Ba)-Dissolved (mg/L) | | | 0.0541 | | 0.0504 | |
| | Beryllium (Be)-Dissolved (ug/L) | | | <0.020 | | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | <0.000050 | | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | | | <0.010 | | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | <0.0050 | | <0.0050 | |
| | Calcium (Ca)-Dissolved (mg/L) | | <0.050 | 31.7 | | 29.7 | |
| | Chromium (Cr)-Dissolved (mg/L) | | | <0.00010 | | <0.00010 | |
| | Cobalt (Co)-Dissolved (ug/L) | | | <0.10 | | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-11 | L2277038-12 | L2277038-13 | L2277038-14 | L2277038-15 |
|-------------------------|---------------------------------------|--------------|------------------------------|--|-------------------------------|---|-------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 14:17 | 14:17 | 13:00 | 13:00 | 15:15 |
| | | Client ID | RG_STPD_WS_20 190521-1417 | RG_STPD_WS_20 190521-1417 FB- HG | RG_ERIMF_WS_2 0190521-1300 | RG_ERIMF_WS_2 0190521-1300 FB- HG | RG_ERWSF_WS_ 20190521-1515 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 57.5 | | 47.2 | | 84.6 |
| | Chromium (Cr)-Total (mg/L) | | 0.00019 | | 0.00022 | | 0.00043 |
| | Cobalt (Co)-Total (ug/L) | | 0.11 | | 0.13 | | 0.14 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | | 0.00092 | | 0.00057 |
| | Iron (Fe)-Total (mg/L) | | 0.022 | | 0.086 | | 0.461 |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | | 0.000054 | | 0.000133 |
| | Lithium (Li)-Total (mg/L) | | 0.0067 | | 0.0052 | | 0.0028 |
| | Magnesium (Mg)-Total (mg/L) | | 17.8 | | 10.7 | | 13.8 |
| | Manganese (Mn)-Total (mg/L) | | 0.00475 | | 0.0161 | | 0.0109 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.000906 | | 0.00123 | | 0.000568 |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | | 0.00073 | | 0.00072 |
| | Potassium (K)-Total (mg/L) | | 0.485 | | 0.809 | | 1.51 |
| | Selenium (Se)-Total (ug/L) | | 6.98 | | 0.076 | | 0.751 |
| | Silicon (Si)-Total (mg/L) | | 1.91 | | 0.98 | | 3.16 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 3.52 | | 8.00 | | 18.1 |
| | Strontium (Sr)-Total (mg/L) | | 0.177 | | 0.155 | | 0.157 |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.000947 | | 0.000367 | | 0.000568 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | | <0.00050 | | 0.00063 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | | 0.0041 | | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | | LAB | | LAB |
| | Dissolved Metals Filtration Location | | LAB | | LAB | | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | <0.0030 | | <0.0030 | | <0.0030 |
| | Antimony (Sb)-Dissolved (mg/L) | | <0.00010 | | 0.00020 | | 0.00014 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00014 | | 0.00032 | | 0.00033 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.103 | | 0.140 | | 0.0966 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | | <0.020 | | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | | <0.010 | | 0.014 |
| | Cadmium (Cd)-Dissolved (ug/L) | | 0.0082 | | <0.0050 | | 0.0071 |
| | Calcium (Ca)-Dissolved (mg/L) | | 56.7 | | 45.7 | | 85.0 |
| | Chromium (Cr)-Dissolved (mg/L) | | 0.00011 | | 0.00012 | | 0.00021 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | | <0.10 | | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | | | | |
|-------------------------|---|----------|--|--|--|
| | L2277038-16 WS 21-MAY-19 15:15 RG_ERWSF_WS_ 20190521-1515 FB-HG | | | | |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) Chromium (Cr)-Total (mg/L) Cobalt (Co)-Total (ug/L) Copper (Cu)-Total (mg/L) Iron (Fe)-Total (mg/L) Lead (Pb)-Total (mg/L) Lithium (Li)-Total (mg/L) Magnesium (Mg)-Total (mg/L) Manganese (Mn)-Total (mg/L) Mercury (Hg)-Total (ug/L) Molybdenum (Mo)-Total (mg/L) Nickel (Ni)-Total (mg/L) Potassium (K)-Total (mg/L) Selenium (Se)-Total (ug/L) Silicon (Si)-Total (mg/L) Silver (Ag)-Total (mg/L) Sodium (Na)-Total (mg/L) Strontium (Sr)-Total (mg/L) Thallium (Tl)-Total (mg/L) Tin (Sn)-Total (mg/L) Titanium (Ti)-Total (mg/L) Uranium (U)-Total (mg/L) Vanadium (V)-Total (mg/L) Zinc (Zn)-Total (mg/L) | <0.00050 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location Dissolved Metals Filtration Location Aluminum (Al)-Dissolved (mg/L) Antimony (Sb)-Dissolved (mg/L) Arsenic (As)-Dissolved (mg/L) Barium (Ba)-Dissolved (mg/L) Beryllium (Be)-Dissolved (ug/L) Bismuth (Bi)-Dissolved (mg/L) Boron (B)-Dissolved (mg/L) Cadmium (Cd)-Dissolved (ug/L) Calcium (Ca)-Dissolved (mg/L) Chromium (Cr)-Dissolved (mg/L) Cobalt (Co)-Dissolved (ug/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | Description | Sampled Date | Sampled Time | Client ID | L2277038-1 | L2277038-2 | L2277038-3 | L2277038-4 | L2277038-5 |
|-------------------------|----------------------------------|--------------|--------------|--------------------------|--------------------------|--------------------------------|------------------------|------------------------------|----------------------------|
| | | | | | WS | WS | WS | WS | WS |
| | | 21-MAY-19 | 09:00 | RG_GRLK_WS_20190521-0900 | 21-MAY-19 09:00 | 21-MAY-19 09:00 | 21-MAY-19 09:33 | 21-MAY-19 09:33 | 21-MAY-19 10:26 |
| | | | | | RG_GRLK_WS_20190521-0900 | RG_GRLK_WS_20190521-0900 FB-HG | RG_GC_WS_20190521-0933 | RG_GC_WS_20190521-0933 FB-HG | RG_FBLANK_WS_20190521-1026 |
| Grouping | Analyte | | | | | | | | |
| WATER | | | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | | | 0.010 | | 0.010 | | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | | | <0.000050 | | <0.000050 | | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0029 | | | <0.0010 | | <0.0010 | | <0.0010 |
| | Magnesium (Mg)-Dissolved (mg/L) | 18.7 | | | 7.05 | | 7.05 | | <0.10 |
| | Manganese (Mn)-Dissolved (mg/L) | <0.00010 | | | 0.00048 | | 0.00048 | | <0.00010 |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | | | <0.0000050 | | <0.0000050 | | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00140 | | | 0.000227 | | 0.000227 | | <0.000050 |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | | | <0.00050 | | <0.00050 | | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | 1.01 | | | 0.540 | | 0.540 | | <0.050 |
| | Selenium (Se)-Dissolved (ug/L) | 0.260 | | | 0.303 | | 0.303 | | <0.050 |
| | Silicon (Si)-Dissolved (mg/L) | 2.49 | | | 3.78 | | 3.78 | | <0.050 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | 1.81 | | | 1.81 | | 1.81 | | <0.050 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.130 | | | 0.0521 | | 0.0521 | | <0.00020 |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | 0.000767 | | | 0.000421 | | 0.000421 | | <0.000010 |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | | | <0.0010 | | <0.0010 | | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-6 | L2277038-7 | L2277038-8 | L2277038-9 | L2277038-10 |
|-------------------------|----------------------------------|--------------|------------------------------|----------------------------|----------------------------------|-----------------------------|-----------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 10:26 | 10:26 | 10:26 | 10:26 | 10:26 |
| | | Client ID | RG_TRIP_WS_201 90521-1026 | RG_ER_WS_2019 0521-1026 | RG_ER_WS_2019 0521-1026 FB-HG | RG_DUP_WS_201 90521-1026 | RG_DUP_WS_201 90521-1026 FB-HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | <0.00050 | | <0.00050 | |
| | Iron (Fe)-Dissolved (mg/L) | | | <0.010 | | <0.010 | |
| | Lead (Pb)-Dissolved (mg/L) | | | <0.000050 | | <0.000050 | |
| | Lithium (Li)-Dissolved (mg/L) | | | 0.0017 | | 0.0016 | |
| | Magnesium (Mg)-Dissolved (mg/L) | <0.0050 | | 11.9 | | 11.2 | |
| | Manganese (Mn)-Dissolved (mg/L) | | | 0.00285 | | 0.00225 | |
| | Mercury (Hg)-Dissolved (mg/L) | | | <0.0000050 | | <0.0000050 | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | 0.000553 | | 0.000533 | |
| | Nickel (Ni)-Dissolved (mg/L) | | | <0.00050 | | <0.00050 | |
| | Potassium (K)-Dissolved (mg/L) | <0.050 | | 0.746 | | 0.685 | |
| | Selenium (Se)-Dissolved (ug/L) | | | 0.999 | | 1.02 | |
| | Silicon (Si)-Dissolved (mg/L) | | | 2.87 | | 2.70 | |
| | Silver (Ag)-Dissolved (mg/L) | | | <0.000010 | | <0.000010 | |
| | Sodium (Na)-Dissolved (mg/L) | <0.050 | | 3.70 | | 3.36 | |
| | Strontium (Sr)-Dissolved (mg/L) | | | 0.114 | | 0.108 | |
| | Thallium (Tl)-Dissolved (mg/L) | | | <0.000010 | | <0.000010 | |
| | Tin (Sn)-Dissolved (mg/L) | | | <0.00010 | | <0.00010 | |
| | Titanium (Ti)-Dissolved (mg/L) | | | <0.010 | | <0.010 | |
| | Uranium (U)-Dissolved (mg/L) | | | 0.000883 | | 0.000826 | |
| | Vanadium (V)-Dissolved (mg/L) | | | <0.00050 | | <0.00050 | |
| | Zinc (Zn)-Dissolved (mg/L) | | | 0.0013 | | 0.0011 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2277038-11 | L2277038-12 | L2277038-13 | L2277038-14 | L2277038-15 |
|-------------------------|----------------------------------|--------------|------------------------------|--|-------------------------------|---|-------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 | 21-MAY-19 |
| | | Sampled Time | 14:17 | 14:17 | 13:00 | 13:00 | 15:15 |
| | | Client ID | RG_STPD_WS_20 190521-1417 | RG_STPD_WS_20 190521-1417 FB- HG | RG_ERIMF_WS_2 0190521-1300 | RG_ERIMF_WS_2 0190521-1300 FB- HG | RG_ERWSF_WS_ 20190521-1515 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | | <0.010 | | <0.010 | | 0.092 |
| | Lead (Pb)-Dissolved (mg/L) | | <0.000050 | | <0.000050 | | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | | 0.0059 | | 0.0044 | | 0.0022 |
| | Magnesium (Mg)-Dissolved (mg/L) | | 17.1 | | 11.1 | | 14.4 |
| | Manganese (Mn)-Dissolved (mg/L) | | 0.00011 | | 0.00014 | | 0.00276 |
| | Mercury (Hg)-Dissolved (mg/L) | | <0.0000050 | | <0.0000050 | | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | | 0.000896 | | 0.00115 | | 0.000599 |
| | Nickel (Ni)-Dissolved (mg/L) | | <0.00050 | | 0.00074 | | 0.00066 |
| | Potassium (K)-Dissolved (mg/L) | | 0.475 | | 0.791 | | 1.50 |
| | Selenium (Se)-Dissolved (ug/L) | | 7.41 | | 0.070 | | 0.840 |
| | Silicon (Si)-Dissolved (mg/L) | | 1.86 | | 0.881 | | 2.74 |
| | Silver (Ag)-Dissolved (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | | 3.38 | | 7.90 | | 18.4 |
| | Strontium (Sr)-Dissolved (mg/L) | | 0.179 | | 0.155 | | 0.161 |
| | Thallium (Tl)-Dissolved (mg/L) | | <0.000010 | | <0.000010 | | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | | <0.00010 | | <0.00010 | | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | | <0.010 | | <0.010 | | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | | 0.000839 | | 0.000336 | | 0.000515 |
| | Vanadium (V)-Dissolved (mg/L) | | <0.00050 | | <0.00050 | | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | | <0.0010 | | 0.0021 | | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | | | | |
|-------------------------|--|--|--|--|--|
| | L2277038-16 WS 21-MAY-19 15:15 RG_ERWSF_WS_ 20190521-1515 FB-HG | | | | |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) Iron (Fe)-Dissolved (mg/L) Lead (Pb)-Dissolved (mg/L) Lithium (Li)-Dissolved (mg/L) Magnesium (Mg)-Dissolved (mg/L) Manganese (Mn)-Dissolved (mg/L) Mercury (Hg)-Dissolved (mg/L) Molybdenum (Mo)-Dissolved (mg/L) Nickel (Ni)-Dissolved (mg/L) Potassium (K)-Dissolved (mg/L) Selenium (Se)-Dissolved (ug/L) Silicon (Si)-Dissolved (mg/L) Silver (Ag)-Dissolved (mg/L) Sodium (Na)-Dissolved (mg/L) Strontium (Sr)-Dissolved (mg/L) Thallium (Tl)-Dissolved (mg/L) Tin (Sn)-Dissolved (mg/L) Titanium (Ti)-Dissolved (mg/L) Uranium (U)-Dissolved (mg/L) Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-MET/D-HG |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|---|
| Method Blank | Copper (Cu)-Dissolved | MB-LOR | L2277038-1, -11, -13, -15, -3, -5, -7, -9 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2277038-1, -11, -13, -15, -3, -5, -7, -9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2277038-1, -11, -13, -15, -3, -5, -7, -9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2277038-1, -11, -13, -15, -3, -5, -7, -9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2277038-1, -11, -13, -15, -3, -5, -7, -9 |
| Matrix Spike | Boron (B)-Total | MS-B | L2277038-1, -11, -13, -15, -3, -5, -6, -7, -9 |
| Matrix Spike | Sodium (Na)-Total | MS-B | L2277038-1, -11, -13, -15, -3, -5, -6, -7, -9 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2277038-1, -11, -13, -15, -3, -5, -6, -7, -9 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|---|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RRV | Reported Result Verified By Repeat Analysis |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |
| The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC. TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved. | | | |
| C-TOT-ORG-LOW-CL | Water | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |

Reference Information

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

Reference Information

It is recommended that this analysis be conducted in the field.

| | | | |
|---|-------|---------------------------------|--------------------------|
| P-T-L-COL-CL | Water | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. | | | |
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

19-12-5

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4647467 | | | | | | | |
| WG3061402-11 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 105.0 | | % | | 85-115 | 28-MAY-19 |
| WG3061402-14 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 105.1 | | % | | 85-115 | 28-MAY-19 |
| WG3061402-10 | MB | | | | | | | |
| Acidity (as CaCO3) | | | 1.4 | | mg/L | | 2 | 28-MAY-19 |
| WG3061402-13 | MB | | | | | | | |
| Acidity (as CaCO3) | | | 1.3 | | mg/L | | 2 | 28-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4648808 | | | | | | | |
| WG3061972-4 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 29-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-11 | DUP | L2277038-1 | | | | | | |
| Beryllium (Be)-Dissolved | | <0.000020 | <0.000020 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| WG3057945-10 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 97.2 | | % | | 80-120 | 24-MAY-19 |
| WG3057945-9 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 24-MAY-19 |
| WG3057945-12 | MS | L2277038-3 | | | | | | |
| Beryllium (Be)-Dissolved | | | 97.9 | | % | | 70-130 | 24-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645179 | | | | | | | |
| WG3058068-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 107.2 | | % | | 80-120 | 27-MAY-19 |
| WG3058068-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 27-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Bromide (Br) | | | 105.8 | | % | | 85-115 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 22-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------------|------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| C-DIS-ORG-LOW-CL Water | | | | | | | | |
| Batch | R4645792 | | | | | | | |
| WG3060711-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 87.6 | | % | | 80-120 | 27-MAY-19 |
| WG3060711-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-MAY-19 |
| C-TOT-ORG-LOW-CL Water | | | | | | | | |
| Batch | R4645792 | | | | | | | |
| WG3060711-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 93.7 | | % | | 80-120 | 27-MAY-19 |
| WG3060711-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-MAY-19 |
| CL-IC-N-CL Water | | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Chloride (Cl) | | | 102.0 | | % | | 90-110 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 22-MAY-19 |
| EC-L-PCT-CL Water | | | | | | | | |
| Batch | R4648808 | | | | | | | |
| WG3061972-4 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 29-MAY-19 |
| F-IC-N-CL Water | | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Fluoride (F) | | | 106.1 | | % | | 90-110 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 22-MAY-19 |
| HG-D-CVAA-VA Water | | | | | | | | |
| Batch | R4646526 | | | | | | | |
| WG3060307-3 | DUP | L2277038-1 | | | | | | |
| Mercury (Hg)-Dissolved | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 28-MAY-19 |
| WG3060307-2 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 103.9 | | % | | 80-120 | 28-MAY-19 |
| WG3060307-1 | MB | LF | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 28-MAY-19 |
| WG3060307-4 | MS | L2277038-3 | | | | | | |
| Mercury (Hg)-Dissolved | | | 76.0 | | % | | 70-130 | 28-MAY-19 |



Quality Control Report

Workorder: L2277038

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|--------------------|------------|-----------|-------|-----|--------|-----------|
| HG-T-U-CVAF-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4645122 | | | | | | | |
| WG3059731-7 | DUP | L2277038-7 | | | | | | |
| Mercury (Hg)-Total | | 0.00101 | 0.00104 | | ug/L | 3.2 | 20 | 27-MAY-19 |
| WG3059731-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 95.5 | | % | | 80-120 | 27-MAY-19 |
| WG3059731-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 27-MAY-19 |
| WG3059731-6 | MS | L2277038-15 | | | | | | |
| Mercury (Hg)-Total | | | 87.3 | | % | | 70-130 | 27-MAY-19 |
| MET-D-CCMS-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4645759 | | | | | | | |
| WG3060652-2 | LCS | TMRM | | | | | | |
| Calcium (Ca)-Dissolved | | | 97.6 | | % | | 80-120 | 28-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 94.8 | | % | | 80-120 | 28-MAY-19 |
| Potassium (K)-Dissolved | | | 99.6 | | % | | 80-120 | 28-MAY-19 |
| Sodium (Na)-Dissolved | | | 105.6 | | % | | 80-120 | 28-MAY-19 |
| WG3060652-1 | MB | | | | | | | |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 28-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| MET-D-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-11 | DUP | L2277038-1 | | | | | | |
| Aluminum (Al)-Dissolved | | <0.0030 | <0.0030 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Antimony (Sb)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Arsenic (As)-Dissolved | | 0.00033 | 0.00036 | | mg/L | 8.6 | 20 | 24-MAY-19 |
| Barium (Ba)-Dissolved | | 0.0599 | 0.0596 | | mg/L | 0.4 | 20 | 24-MAY-19 |
| Bismuth (Bi)-Dissolved | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Boron (B)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Cadmium (Cd)-Dissolved | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Calcium (Ca)-Dissolved | | 35.6 | 35.1 | | mg/L | 1.3 | 20 | 24-MAY-19 |
| Chromium (Cr)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Cobalt (Co)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Copper (Cu)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Iron (Fe)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Lead (Pb)-Dissolved | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |



Quality Control Report

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|-----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-11 | DUP | L2277038-1 | | | | | | |
| Lithium (Li)-Dissolved | | 0.0029 | 0.0029 | | mg/L | 1.3 | 20 | 24-MAY-19 |
| Magnesium (Mg)-Dissolved | | 18.7 | 18.5 | | mg/L | 1.2 | 20 | 24-MAY-19 |
| Manganese (Mn)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Nickel (Ni)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Potassium (K)-Dissolved | | 1.01 | 1.01 | | mg/L | 0.0 | 20 | 24-MAY-19 |
| Selenium (Se)-Dissolved | | 0.000260 | 0.000247 | | mg/L | 5.1 | 20 | 24-MAY-19 |
| Silicon (Si)-Dissolved | | 2.49 | 2.53 | | mg/L | 1.6 | 20 | 24-MAY-19 |
| Silver (Ag)-Dissolved | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Sodium (Na)-Dissolved | | 1.81 | 1.84 | | mg/L | 1.9 | 20 | 24-MAY-19 |
| Strontium (Sr)-Dissolved | | 0.130 | 0.132 | | mg/L | 1.3 | 20 | 24-MAY-19 |
| Thallium (Tl)-Dissolved | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Tin (Sn)-Dissolved | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Titanium (Ti)-Dissolved | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Uranium (U)-Dissolved | | 0.000767 | 0.000773 | | mg/L | 0.8 | 20 | 24-MAY-19 |
| Vanadium (V)-Dissolved | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| Zinc (Zn)-Dissolved | | <0.0010 | <0.0010 | RPD-NA | mg/L | N/A | 20 | 24-MAY-19 |
| WG3057945-10 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 105.2 | | % | | 80-120 | 24-MAY-19 |
| Antimony (Sb)-Dissolved | | | 96.1 | | % | | 80-120 | 24-MAY-19 |
| Arsenic (As)-Dissolved | | | 101.7 | | % | | 80-120 | 24-MAY-19 |
| Barium (Ba)-Dissolved | | | 113.3 | | % | | 80-120 | 24-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 97.1 | | % | | 80-120 | 24-MAY-19 |
| Boron (B)-Dissolved | | | 96.0 | | % | | 80-120 | 24-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 99.3 | | % | | 80-120 | 24-MAY-19 |
| Calcium (Ca)-Dissolved | | | 97.1 | | % | | 80-120 | 24-MAY-19 |
| Chromium (Cr)-Dissolved | | | 102.3 | | % | | 80-120 | 24-MAY-19 |
| Cobalt (Co)-Dissolved | | | 101.5 | | % | | 80-120 | 24-MAY-19 |
| Copper (Cu)-Dissolved | | | 100.0 | | % | | 80-120 | 24-MAY-19 |
| Iron (Fe)-Dissolved | | | 99.5 | | % | | 80-120 | 24-MAY-19 |
| Lead (Pb)-Dissolved | | | 99.7 | | % | | 80-120 | 24-MAY-19 |
| Lithium (Li)-Dissolved | | | 95.0 | | % | | 80-120 | 24-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 103.8 | | % | | 80-120 | 24-MAY-19 |
| Manganese (Mn)-Dissolved | | | 105.5 | | % | | 80-120 | 24-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 103.0 | | % | | 80-120 | 24-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-10 | LCS | | | | | | | |
| Nickel (Ni)-Dissolved | | | 100.0 | | % | | 80-120 | 24-MAY-19 |
| Potassium (K)-Dissolved | | | 103.4 | | % | | 80-120 | 24-MAY-19 |
| Selenium (Se)-Dissolved | | | 102.6 | | % | | 80-120 | 24-MAY-19 |
| Silicon (Si)-Dissolved | | | 109.4 | | % | | 60-140 | 24-MAY-19 |
| Silver (Ag)-Dissolved | | | 101.4 | | % | | 80-120 | 24-MAY-19 |
| Sodium (Na)-Dissolved | | | 108.0 | | % | | 80-120 | 24-MAY-19 |
| Strontium (Sr)-Dissolved | | | 100.0 | | % | | 80-120 | 24-MAY-19 |
| Thallium (Tl)-Dissolved | | | 99.1 | | % | | 80-120 | 24-MAY-19 |
| Tin (Sn)-Dissolved | | | 99.9 | | % | | 80-120 | 24-MAY-19 |
| Titanium (Ti)-Dissolved | | | 104.1 | | % | | 80-120 | 24-MAY-19 |
| Uranium (U)-Dissolved | | | 101.0 | | % | | 80-120 | 24-MAY-19 |
| Vanadium (V)-Dissolved | | | 104.8 | | % | | 80-120 | 24-MAY-19 |
| Zinc (Zn)-Dissolved | | | 96.9 | | % | | 80-120 | 24-MAY-19 |
| WG3057945-9 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 24-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 24-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 24-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 24-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Copper (Cu)-Dissolved | | | 0.0148 | MB-LOR | mg/L | | 0.0002 | 24-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 24-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 24-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 24-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 24-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 24-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 24-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 24-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-9 MB | | LF | | | | | | |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 24-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 24-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 24-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 24-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 24-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 24-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 24-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 24-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 24-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| WG3057945-12 MS | | L2277038-3 | | | | | | |
| Aluminum (Al)-Dissolved | | | 98.4 | | % | | 70-130 | 24-MAY-19 |
| Antimony (Sb)-Dissolved | | | 94.6 | | % | | 70-130 | 24-MAY-19 |
| Arsenic (As)-Dissolved | | | 101.0 | | % | | 70-130 | 24-MAY-19 |
| Barium (Ba)-Dissolved | | | N/A | MS-B | % | | - | 24-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 81.3 | | % | | 70-130 | 24-MAY-19 |
| Boron (B)-Dissolved | | | 93.9 | | % | | 70-130 | 24-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 101.1 | | % | | 70-130 | 24-MAY-19 |
| Calcium (Ca)-Dissolved | | | N/A | MS-B | % | | - | 24-MAY-19 |
| Chromium (Cr)-Dissolved | | | 98.7 | | % | | 70-130 | 24-MAY-19 |
| Cobalt (Co)-Dissolved | | | 98.9 | | % | | 70-130 | 24-MAY-19 |
| Copper (Cu)-Dissolved | | | 99.4 | | % | | 70-130 | 24-MAY-19 |
| Iron (Fe)-Dissolved | | | 97.4 | | % | | 70-130 | 24-MAY-19 |
| Lead (Pb)-Dissolved | | | 93.3 | | % | | 70-130 | 24-MAY-19 |
| Lithium (Li)-Dissolved | | | 96.2 | | % | | 70-130 | 24-MAY-19 |
| Magnesium (Mg)-Dissolved | | | N/A | MS-B | % | | - | 24-MAY-19 |
| Manganese (Mn)-Dissolved | | | 96.7 | | % | | 70-130 | 24-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 97.6 | | % | | 70-130 | 24-MAY-19 |
| Nickel (Ni)-Dissolved | | | 97.4 | | % | | 70-130 | 24-MAY-19 |
| Potassium (K)-Dissolved | | | 98.2 | | % | | 70-130 | 24-MAY-19 |
| Selenium (Se)-Dissolved | | | 104.9 | | % | | 70-130 | 24-MAY-19 |
| Silicon (Si)-Dissolved | | | 97.9 | | % | | 70-130 | 24-MAY-19 |
| Silver (Ag)-Dissolved | | | 96.0 | | % | | 70-130 | 24-MAY-19 |
| Sodium (Na)-Dissolved | | | 91.8 | | % | | 70-130 | 24-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644967 | | | | | | | |
| WG3057945-12 MS | | L2277038-3 | | | | | | |
| Strontium (Sr)-Dissolved | | | N/A | MS-B | % | | - | 24-MAY-19 |
| Thallium (Tl)-Dissolved | | | 93.2 | | % | | 70-130 | 24-MAY-19 |
| Tin (Sn)-Dissolved | | | 96.2 | | % | | 70-130 | 24-MAY-19 |
| Titanium (Ti)-Dissolved | | | 102.9 | | % | | 70-130 | 24-MAY-19 |
| Uranium (U)-Dissolved | | | 92.1 | | % | | 70-130 | 24-MAY-19 |
| Vanadium (V)-Dissolved | | | 100.8 | | % | | 70-130 | 24-MAY-19 |
| Zinc (Zn)-Dissolved | | | 98.6 | | % | | 70-130 | 24-MAY-19 |
| Batch | R4645132 | | | | | | | |
| WG3057945-11 DUP | | L2277038-1 | | | | | | |
| Molybdenum (Mo)-Dissolved | | 0.00140 | 0.00134 | | mg/L | 4.7 | 20 | 27-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645179 | | | | | | | |
| WG3058068-2 LCS | | | | | | | | |
| Aluminum (Al)-Total | | | 104.0 | | % | | 80-120 | 27-MAY-19 |
| Antimony (Sb)-Total | | | 108.1 | | % | | 80-120 | 27-MAY-19 |
| Arsenic (As)-Total | | | 104.3 | | % | | 80-120 | 27-MAY-19 |
| Barium (Ba)-Total | | | 103.3 | | % | | 80-120 | 27-MAY-19 |
| Bismuth (Bi)-Total | | | 102.0 | | % | | 80-120 | 27-MAY-19 |
| Boron (B)-Total | | | 104.9 | | % | | 80-120 | 27-MAY-19 |
| Cadmium (Cd)-Total | | | 106.5 | | % | | 80-120 | 27-MAY-19 |
| Calcium (Ca)-Total | | | 103.4 | | % | | 80-120 | 27-MAY-19 |
| Cobalt (Co)-Total | | | 105.6 | | % | | 80-120 | 27-MAY-19 |
| Copper (Cu)-Total | | | 103.6 | | % | | 80-120 | 27-MAY-19 |
| Lead (Pb)-Total | | | 102.3 | | % | | 80-120 | 27-MAY-19 |
| Lithium (Li)-Total | | | 108.0 | | % | | 80-120 | 27-MAY-19 |
| Magnesium (Mg)-Total | | | 103.9 | | % | | 80-120 | 27-MAY-19 |
| Manganese (Mn)-Total | | | 110.9 | | % | | 80-120 | 27-MAY-19 |
| Molybdenum (Mo)-Total | | | 104.4 | | % | | 80-120 | 27-MAY-19 |
| Nickel (Ni)-Total | | | 104.8 | | % | | 80-120 | 27-MAY-19 |
| Potassium (K)-Total | | | 107.3 | | % | | 80-120 | 27-MAY-19 |
| Selenium (Se)-Total | | | 106.8 | | % | | 80-120 | 27-MAY-19 |
| Silicon (Si)-Total | | | 118.3 | | % | | 80-120 | 27-MAY-19 |
| Silver (Ag)-Total | | | 113.8 | | % | | 80-120 | 27-MAY-19 |
| Sodium (Na)-Total | | | 109.3 | | % | | 80-120 | 27-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645179 | | | | | | | |
| WG3058068-2 | LCS | | | | | | | |
| Strontium (Sr)-Total | | | 108.4 | | % | | 80-120 | 27-MAY-19 |
| Thallium (Tl)-Total | | | 100.5 | | % | | 80-120 | 27-MAY-19 |
| Tin (Sn)-Total | | | 105.2 | | % | | 80-120 | 27-MAY-19 |
| Titanium (Ti)-Total | | | 100.4 | | % | | 80-120 | 27-MAY-19 |
| Uranium (U)-Total | | | 111.0 | | % | | 80-120 | 27-MAY-19 |
| Vanadium (V)-Total | | | 108.9 | | % | | 80-120 | 27-MAY-19 |
| Zinc (Zn)-Total | | | 111.4 | | % | | 80-120 | 27-MAY-19 |
| WG3058068-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 27-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 27-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 27-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 27-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 27-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 27-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 27-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 27-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 27-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 27-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 27-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 27-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 27-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 27-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 27-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 27-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 27-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 27-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 27-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 27-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 27-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|--------|--------------|----------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch R4645179 | | | | | | | | |
| WG3058068-1 MB | | | | | | | | |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 27-MAY-19 |
| Batch R4646029 | | | | | | | | |
| WG3058068-2 LCS | | | | | | | | |
| Chromium (Cr)-Total | | | 107.3 | | % | | 80-120 | 27-MAY-19 |
| Iron (Fe)-Total | | | 97.8 | | % | | 80-120 | 27-MAY-19 |
| WG3058068-1 MB | | | | | | | | |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 27-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 27-MAY-19 |
| Batch R4647134 | | | | | | | | |
| WG3061003-2 LCS | | | | | | | | |
| Aluminum (Al)-Total | | | 101.6 | | % | | 80-120 | 29-MAY-19 |
| Antimony (Sb)-Total | | | 114.5 | | % | | 80-120 | 29-MAY-19 |
| Arsenic (As)-Total | | | 102.1 | | % | | 80-120 | 29-MAY-19 |
| Barium (Ba)-Total | | | 109.1 | | % | | 80-120 | 29-MAY-19 |
| Bismuth (Bi)-Total | | | 112.8 | | % | | 80-120 | 29-MAY-19 |
| Boron (B)-Total | | | 98.2 | | % | | 80-120 | 29-MAY-19 |
| Cadmium (Cd)-Total | | | 104.9 | | % | | 80-120 | 29-MAY-19 |
| Calcium (Ca)-Total | | | 104.6 | | % | | 80-120 | 29-MAY-19 |
| Chromium (Cr)-Total | | | 103.2 | | % | | 80-120 | 29-MAY-19 |
| Cobalt (Co)-Total | | | 102.1 | | % | | 80-120 | 29-MAY-19 |
| Copper (Cu)-Total | | | 100.6 | | % | | 80-120 | 29-MAY-19 |
| Iron (Fe)-Total | | | 97.3 | | % | | 80-120 | 29-MAY-19 |
| Lead (Pb)-Total | | | 106.1 | | % | | 80-120 | 29-MAY-19 |
| Lithium (Li)-Total | | | 100.6 | | % | | 80-120 | 29-MAY-19 |
| Magnesium (Mg)-Total | | | 103.4 | | % | | 80-120 | 29-MAY-19 |
| Manganese (Mn)-Total | | | 103.5 | | % | | 80-120 | 29-MAY-19 |
| Molybdenum (Mo)-Total | | | 107.7 | | % | | 80-120 | 29-MAY-19 |
| Nickel (Ni)-Total | | | 99.2 | | % | | 80-120 | 29-MAY-19 |
| Potassium (K)-Total | | | 104.5 | | % | | 80-120 | 29-MAY-19 |
| Selenium (Se)-Total | | | 100.4 | | % | | 80-120 | 29-MAY-19 |
| Silicon (Si)-Total | | | 105.1 | | % | | 80-120 | 29-MAY-19 |
| Silver (Ag)-Total | | | 107.3 | | % | | 80-120 | 29-MAY-19 |
| Sodium (Na)-Total | | | 106.9 | | % | | 80-120 | 29-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4647134 | | | | | | | |
| WG3061003-2 LCS | | | | | | | | |
| Strontium (Sr)-Total | | | 106.3 | | % | | 80-120 | 29-MAY-19 |
| Thallium (Tl)-Total | | | 105.6 | | % | | 80-120 | 29-MAY-19 |
| Tin (Sn)-Total | | | 105.5 | | % | | 80-120 | 29-MAY-19 |
| Titanium (Ti)-Total | | | 103.1 | | % | | 80-120 | 29-MAY-19 |
| Uranium (U)-Total | | | 100.2 | | % | | 80-120 | 29-MAY-19 |
| Vanadium (V)-Total | | | 104.7 | | % | | 80-120 | 29-MAY-19 |
| Zinc (Zn)-Total | | | 100.5 | | % | | 80-120 | 29-MAY-19 |
| WG3061003-1 MB | | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 29-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 29-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 29-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 29-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 29-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 29-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 29-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 29-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 29-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|--------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4647134 | | | | | | | |
| WG3061003-1 | MB | | | | | | | |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 29-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 29-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 29-MAY-19 |
| NH3-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645760 | | | | | | | |
| WG3060291-10 | LCS | | | | | | | |
| Ammonia as N | | | 99.2 | | % | | 85-115 | 27-MAY-19 |
| WG3060291-9 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 27-MAY-19 |
| NO2-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Nitrite (as N) | | | 106.1 | | % | | 90-110 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 22-MAY-19 |
| NO3-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Nitrate (as N) | | | 102.8 | | % | | 90-110 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 22-MAY-19 |
| ORP-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645303 | | | | | | | |
| WG3059764-1 | CRM | CL-ORP | | | | | | |
| ORP | | | 222 | | mV | | 210-230 | 27-MAY-19 |
| WG3059764-2 | DUP | L2277038-13 | | | | | | |
| ORP | | 413 | 405 | J | mV | 8.3 | 15 | 27-MAY-19 |
| P-T-L-COL-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645492 | | | | | | | |
| WG3060338-18 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 102.1 | | % | | 80-120 | 27-MAY-19 |
| WG3060338-17 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 27-MAY-19 |
| PO4-DO-L-COL-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| PO4-DO-L-COL-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4643346 | | | | | | | |
| WG3057792-10 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 98.9 | | % | | 80-120 | 24-MAY-19 |
| WG3057792-14 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 97.6 | | % | | 80-120 | 24-MAY-19 |
| WG3057792-13 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| WG3057792-9 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| WG3057792-12 | MS | L2277038-9 | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 94.7 | | % | | 70-130 | 23-MAY-19 |
| SO4-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4641262 | | | | | | | |
| WG3056695-10 | LCS | | | | | | | |
| Sulfate (SO4) | | | 102.6 | | % | | 90-110 | 22-MAY-19 |
| WG3056695-9 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 22-MAY-19 |
| SOLIDS-TDS-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645916 | | | | | | | |
| WG3059255-6 | DUP | L2277038-1 | | | | | | |
| Total Dissolved Solids | | 171 | 177 | | mg/L | 3.5 | 20 | 27-MAY-19 |
| WG3059255-5 | LCS | | | | | | | |
| Total Dissolved Solids | | | 94.5 | | % | | 85-115 | 27-MAY-19 |
| WG3059255-8 | LCS | | | | | | | |
| Total Dissolved Solids | | | 98.0 | | % | | 85-115 | 27-MAY-19 |
| WG3059255-4 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 27-MAY-19 |
| WG3059255-7 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 27-MAY-19 |
| TKN-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4647726 | | | | | | | |
| WG3061425-2 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 98.3 | | % | | 75-125 | 29-MAY-19 |
| WG3061425-4 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 99.6 | | % | | 75-125 | 29-MAY-19 |
| WG3061425-1 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| WG3061425-3 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |



Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-----------|--------|-----------|-------|-----|--------|-----------|
| TSS-L-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645669 | | | | | | | |
| WG3058876-4 | LCS | | | | | | | |
| Total Suspended Solids | | | 97.5 | | % | | 85-115 | 26-MAY-19 |
| WG3058876-3 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 26-MAY-19 |
| Batch | R4647849 | | | | | | | |
| WG3060857-2 | LCS | | | | | | | |
| Total Suspended Solids | | | 95.7 | | % | | 85-115 | 28-MAY-19 |
| WG3060857-1 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 28-MAY-19 |
| TURBIDITY-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4640924 | | | | | | | |
| WG3056281-20 | LCS | | | | | | | |
| Turbidity | | | 98.0 | | % | | 85-115 | 22-MAY-19 |
| WG3056281-19 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 22-MAY-19 |

Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2277038

Report Date: 31-MAY-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | | | | | | | |
| | 1 | 21-MAY-19 09:00 | 27-MAY-19 09:30 | 0.25 | 144 | hours | EHTR-FM |
| | 3 | 21-MAY-19 09:33 | 27-MAY-19 09:30 | 0.25 | 144 | hours | EHTR-FM |
| | 5 | 21-MAY-19 10:26 | 27-MAY-19 09:30 | 0.25 | 143 | hours | EHTR-FM |
| | 6 | 21-MAY-19 10:26 | 27-MAY-19 09:30 | 0.25 | 143 | hours | EHTR-FM |
| | 7 | 21-MAY-19 10:26 | 27-MAY-19 09:30 | 0.25 | 143 | hours | EHTR-FM |
| | 9 | 21-MAY-19 10:26 | 27-MAY-19 09:30 | 0.25 | 143 | hours | EHTR-FM |
| | 11 | 21-MAY-19 14:17 | 27-MAY-19 09:30 | 0.25 | 139 | hours | EHTR-FM |
| | 13 | 21-MAY-19 13:00 | 27-MAY-19 09:30 | 0.25 | 140 | hours | EHTR-FM |
| | 15 | 21-MAY-19 15:15 | 27-MAY-19 09:30 | 0.25 | 138 | hours | EHTR-FM |
| pH | | | | | | | |
| | 1 | 21-MAY-19 09:00 | 29-MAY-19 10:00 | 0.25 | 193 | hours | EHTR-FM |
| | 3 | 21-MAY-19 09:33 | 29-MAY-19 10:00 | 0.25 | 192 | hours | EHTR-FM |
| | 5 | 21-MAY-19 10:26 | 29-MAY-19 13:00 | 0.25 | 195 | hours | EHTR-FM |
| | 6 | 21-MAY-19 10:26 | 29-MAY-19 13:00 | 0.25 | 195 | hours | EHTR-FM |
| | 7 | 21-MAY-19 10:26 | 29-MAY-19 13:00 | 0.25 | 195 | hours | EHTR-FM |
| | 9 | 21-MAY-19 10:26 | 29-MAY-19 13:00 | 0.25 | 195 | hours | EHTR-FM |
| | 11 | 21-MAY-19 14:17 | 29-MAY-19 13:00 | 0.25 | 191 | hours | EHTR-FM |
| | 13 | 21-MAY-19 13:00 | 29-MAY-19 13:00 | 0.25 | 192 | hours | EHTR-FM |
| | 15 | 21-MAY-19 15:15 | 29-MAY-19 13:00 | 0.25 | 190 | hours | EHTR-FM |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:
 Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
 Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2277038 were received on 22-MAY-19 08:50.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

| | | | |
|----------------------|--|------------------|-------------------------------|
| COC ID: | 19-12 Leach Area Supporting Study Tox Shd | TURNAROUND TIME: | |
| PROJECT/CLIENT INFO | | LABORATORY | |
| Facility Name / Job: | Regional Effects Program (REP) | Lab Name: | ALS Calgary |
| Project Manager: | Cair Good | Lab Contact: | Lyudmyla Shvets |
| Email: | cair.good@teck.com | Email: | lyudmyla.shvets@alsglobal.com |
| Address: | 421 Pine Avenue | Address: | 2559 29 Street NE |
| City: | Sparwood | Province: | BC |
| Postal Code: | VOB 2G0 | Country: | Canada |
| Phone Number: | 250-425-8202 | City: | Calgary |
| | | Province: | AB |
| | | Postal Code: | T1Y 7B5 |
| | | Country: | Canada |
| | | Phone Number: | 1 403 407 1794 |



| SAMPLE DETAILS | | | | | | | | ANALYSIS REQUESTED | | | | | | | |
|------------------------------|-----------------|--------------|-----------------------------|-----------|-------------|---------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|--|
| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G-Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-BDC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | |
| 1 RG-GRUK WS-20190521-0900 | RG-GRUK | WS | No | 21-May-19 | 0900 | G | 7 | X | X | X | X | X | X | X | |
| 2 RG-GRUK WS-20190521-0900 | RG-GRUK | WS | No | 21-May-19 | 0900 | G | 1 | | | | | | | | |
| 3 RG-CC WS-20190521-0933 | RG-CC | WS | No | 21-May-19 | 0933 | G | 7 | X | X | X | X | X | X | X | |
| 4 RG-CC WS-20190521-0933 | RG-CC | WS | No | 21-May-19 | 0933 | G | 1 | | | | | | | | |
| 5 RG-FBLANK WS-20190521-1026 | RG-FBLANK | WS | No | 21-May-19 | 1026 | G | 7 | X | X | X | X | X | X | X | |
| 6 RG-TRIP WS-20190521-1026 | RG-TRIP | WS | No | 21-May-19 | 1026 | G | 4 | X | X | X | X | X | X | X | |
| 7 RG-ER WS-20190521-1026 | RG-ER | WS | No | 21-May-19 | 1026 | G | 7 | X | X | X | X | X | X | X | |
| 8 RG-ER WS-20190521-1026 | RG-ER | WS | No | 21-May-19 | 1026 | G | 1 | | | | | | | | |
| 9 RG-DUP WS-20190521-1026 | RG-DUP | WS | No | 21-May-19 | 1026 | G | 7 | X | X | X | X | X | X | X | |
| 10 RG-DUP WS-20190521-1026 | RG-DUP | WS | No | 21-May-19 | 1026 | G | 1 | | | | | | | | |
| 11 RG-STPD WS-20190521-1417 | RG-STPD | WS | No | 21-May-19 | 1417 | G | 7 | X | X | X | X | X | X | X | |
| 12 RG-STPD WS-20190521-1417 | RG-STPD | WS | No | 21-May-19 | 1417 | G | 1 | | | | | | | | |
| 13 RG-ERUMF WS-20190521-1300 | RG-ERUMF | WS | No | 21-May-19 | 1300 | G | 7 | X | X | X | X | X | X | X | |
| 14 RG-ERUMF WS-20190521-1300 | RG-ERUMF | WS | No | 21-May-19 | 1300 | G | 1 | | | | | | | | |
| 15 RG-ERUSF WS-20190521-1515 | RG-ERUSF | WS | No | 21-May-19 | 1515 | G | 7 | X | X | X | X | X | X | X | |
| 16 RG-ERUSF WS-20190521-1515 | RG-ERUSF | WS | No | 21-May-19 | 1515 | G | 1 | | | | | | | | |

| | | | |
|---|----------------------------------|-----------|-------------------------|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | RELINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
| | | | <i>[Signature]</i> |
| NB OF BOTTLES RETURNED/DESCRIPTION | Sampler's Name | Mobile # | Date/Time |
| Regular (default) x Priority (2-3 business days) - 50% surcharge Emergency (1 Business Day) - 100% surcharge For Emergency <1 Day, ASAP or Weekend - Contact ALS | Lisa Bonza <i>[Signature]</i> | | 21 May -19 @ 17:00 |

[Handwritten marks]



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 23-MAY-19
Report Date: 01-JUN-19 16:46 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2278104
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: 19-12
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|--------------------------|---|----------|-----------|--------|-------|-----------|-----------|-----|
| L2278104-1 | RG_LNLK_WS_20190522-1055 | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 10:55 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Total Organic Carbon | 8.99 | | 0.5 | mg/L | | 28-MAY-19 | HSC |
| | | Total Kjeldahl Nitrogen | 0.862 | | 0.05 | mg/L | | 31-MAY-19 | SCL |
| | | Mercury (Hg)-Total | <0.00050 | | 0.0005 | ug/L | | 28-MAY-19 | MA2 |
| | | Dissolved Organic Carbon | 8.04 | | 0.5 | mg/L | | 28-MAY-19 | HSC |
| | | Routine for Teck Coal | | | | | | | |
| | | Phosphorus (P)-Total | | | | | | | |
| | | Phosphorus (P)-Total | 0.0043 | | 0.002 | mg/L | | 29-MAY-19 | RZF |
| | | Ion Balance | 99.0 | | -100 | % | | 30-MAY-19 | |
| | | ORP | 428 | | -1000 | mV | | 28-MAY-19 | RGB |
| | | pH | 8.30 | | 0.1 | pH | | 30-MAY-19 | RMS |
| | | Turbidity | | | | | | | |
| | | Turbidity | 0.33 | | 0.1 | NTU | | 24-MAY-19 | RGB |
| | | Total Suspended Solids | | | | | | | |
| | | Total Suspended Solids | <1.0 | | 1 | mg/L | | 29-MAY-19 | EDT |
| | | Total Dissolved Solids | | | | | | | |
| | | Total Dissolved Solids | 141 | DLHC | 20 | mg/L | | 28-MAY-19 | LT2 |
| | | Sulfate in Water by IC | | | | | | | |
| | | Sulfate (SO4) | 3.56 | | 0.3 | mg/L | | 24-MAY-19 | RMS |
| | | Orthophosphate-Dissolved (as P) | | | | | | | |
| | | Orthophosphate-Dissolved (as P) | <0.0010 | | 0.001 | mg/L | | 24-MAY-19 | RZF |
| | | Nitrite in Water by IC (Low Level) | | | | | | | |
| | | Nitrite (as N) | <0.0010 | | 0.001 | mg/L | | 24-MAY-19 | RMS |
| | | Nitrate in Water by IC (Low Level) | | | | | | | |
| | | Nitrate (as N) | <0.0050 | | 0.005 | mg/L | | 24-MAY-19 | RMS |
| | | Ion Balance Calculation | | | | | | | |
| | | Cation - Anion Balance | -0.5 | | | % | | 30-MAY-19 | |
| | | Anion Sum | 2.96 | | | meq/L | | 30-MAY-19 | |
| | | Cation Sum | 2.93 | | | meq/L | | 30-MAY-19 | |
| | | Fluoride in Water by IC | | | | | | | |
| | | Fluoride (F) | 0.060 | | 0.02 | mg/L | | 24-MAY-19 | RMS |
| | | Electrical Conductivity (EC) | | | | | | | |
| | | Conductivity (@ 25C) | 270 | | 2 | uS/cm | | 30-MAY-19 | RMS |
| | | Chloride in Water by IC | | | | | | | |
| | | Chloride (Cl) | 2.63 | | 0.5 | mg/L | | 24-MAY-19 | RMS |
| | | Bromide in Water by IC (Low Level) | | | | | | | |
| | | Bromide (Br) | <0.050 | | 0.05 | mg/L | | 24-MAY-19 | RMS |
| | | Ammonia, Total (as N) | | | | | | | |
| | | Ammonia as N | 0.0917 | | 0.005 | mg/L | | 31-MAY-19 | LWY |
| | | Alkalinity (Species) by Manual Titration | | | | | | | |
| | | Alkalinity, Bicarbonate (as CaCO3) | 139 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Carbonate (as CaCO3) | 1.2 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Hydroxide (as CaCO3) | <1.0 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Total (as CaCO3) | 140 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Acidity by Automatic Titration | | | | | | | |
| | | Acidity (as CaCO3) | <1.0 | | 1 | mg/L | | 29-MAY-19 | CH3 |
| | | Dissolved Metals in Water | | | | | | | |
| | | Dissolved Metals in Water by CRC ICPMS | | | | | | | |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|--------------------------|---|------------|-----------|----------|-------|-----------|-----------|------|
| L2278104-1 | RG_LNLK_WS_20190522-1055 | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 10:55 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Dissolved Metals in Water | | | | | | | |
| | | Dissolved Metals in Water by CRC ICPMS | | | | | | | |
| | | Dissolved Metals Filtration Location | LAB | | | | | 26-MAY-19 | EM2 |
| | | Aluminum (Al)-Dissolved | <0.0030 | | 0.003 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Antimony (Sb)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Arsenic (As)-Dissolved | 0.00048 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Barium (Ba)-Dissolved | 0.208 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Bismuth (Bi)-Dissolved | <0.000050 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Boron (B)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Cadmium (Cd)-Dissolved | <0.0000050 | | 0.000005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Calcium (Ca)-Dissolved | 28.3 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Chromium (Cr)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Cobalt (Co)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Copper (Cu)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Iron (Fe)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Lead (Pb)-Dissolved | <0.000050 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Lithium (Li)-Dissolved | 0.0015 | | 0.001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Magnesium (Mg)-Dissolved | 15.8 | | 0.1 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Manganese (Mn)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Molybdenum (Mo)-Dissolved | 0.000369 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Nickel (Ni)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Potassium (K)-Dissolved | 1.20 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Selenium (Se)-Dissolved | <0.000050 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Silicon (Si)-Dissolved | 2.50 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Silver (Ag)-Dissolved | <0.000010 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Sodium (Na)-Dissolved | 4.31 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Strontium (Sr)-Dissolved | 0.0842 | | 0.0002 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Thallium (Tl)-Dissolved | <0.000010 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Tin (Sn)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Titanium (Ti)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Uranium (U)-Dissolved | 0.000242 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Vanadium (V)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Zinc (Zn)-Dissolved | <0.0010 | | 0.001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Diss. Mercury in Water by CVAAS or CVAFS | | | | | | | |
| | | Dissolved Mercury Filtration Location | LAB | | | | | 28-MAY-19 | EB3 |
| | | Mercury (Hg)-Dissolved | <0.0000050 | | 0.000005 | mg/L | 28-MAY-19 | 28-MAY-19 | EB3 |
| | | Diss. Be (low) in Water by CRC ICPMS | | | | | | | |
| | | Beryllium (Be)-Dissolved | <0.000020 | | 0.00002 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Dissolved Metals Filtration Location | LAB | | | | | 26-MAY-19 | EM2 |
| | | Total Metals in Water | | | | | | | |
| | | Total Metals in Water by CRC ICPMS | | | | | | | |
| | | Aluminum (Al)-Total | 0.0061 | | 0.003 | mg/L | | 27-MAY-19 | LVD |
| | | Antimony (Sb)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Arsenic (As)-Total | 0.00052 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Barium (Ba)-Total | 0.206 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Bismuth (Bi)-Total | <0.000050 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Boron (B)-Total | <0.010 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Cadmium (Cd)-Total | <0.0000050 | | 0.000005 | mg/L | | 27-MAY-19 | LVD |
| | | Calcium (Ca)-Total | 29.4 | | 0.05 | mg/L | | 27-MAY-19 | LVD |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|---|--------------------------------|--------------------------------------|-----------|-----------|----------|-------|-----------|-----------|------|
| L2278104-1 | RG_LNLK_WS_20190522-1055 | | | | | | | | |
| Sample Date: CLIENT on 22-MAY-19 @ 10:55 | | | | | | | | | |
| Matrix: WS | | | | | | | | | |
| Total Metals in Water | | | | | | | | | |
| Total Metals in Water by CRC ICPMS | | | | | | | | | |
| | | Chromium (Cr)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Cobalt (Co)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Copper (Cu)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Iron (Fe)-Total | <0.010 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Lead (Pb)-Total | <0.000050 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Lithium (Li)-Total | 0.0016 | | 0.001 | mg/L | | 27-MAY-19 | LVD |
| | | Magnesium (Mg)-Total | 15.4 | | 0.1 | mg/L | | 27-MAY-19 | LVD |
| | | Manganese (Mn)-Total | 0.00237 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Molybdenum (Mo)-Total | 0.000314 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Nickel (Ni)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Potassium (K)-Total | 1.18 | | 0.05 | mg/L | | 27-MAY-19 | LVD |
| | | Selenium (Se)-Total | <0.000050 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Silicon (Si)-Total | 2.31 | | 0.1 | mg/L | | 27-MAY-19 | LVD |
| | | Silver (Ag)-Total | <0.000010 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Sodium (Na)-Total | 3.90 | | 0.05 | mg/L | | 27-MAY-19 | LVD |
| | | Strontium (Sr)-Total | 0.0783 | | 0.0002 | mg/L | | 27-MAY-19 | LVD |
| | | Thallium (Tl)-Total | <0.000010 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Tin (Sn)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Titanium (Ti)-Total | <0.010 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Uranium (U)-Total | 0.000220 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Vanadium (V)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Zinc (Zn)-Total | <0.0030 | | 0.003 | mg/L | | 27-MAY-19 | LVD |
| Total Be (Low) in Water by CRC ICPMS | | | | | | | | | |
| | | Beryllium (Be)-Total | <0.000020 | | 0.00002 | mg/L | | 27-MAY-19 | LVD |
| Hardness | | | | | | | | | |
| | | Hardness (as CaCO3) | 136 | | 0.5 | mg/L | | 28-MAY-19 | |
| L2278104-2 | RG_LNLK_WS_20190522-1055_FB-HG | | | | | | | | |
| Sample Date: CLIENT on 22-MAY-19 @ 10:55 | | | | | | | | | |
| Matrix: WS | | | | | | | | | |
| | | Mercury (Hg)-Total | <0.00050 | | 0.0005 | ug/L | | 28-MAY-19 | MA2 |
| L2278104-5 | RG_EROL_WS_20190522-1310 | | | | | | | | |
| Sample Date: CLIENT on 22-MAY-19 @ 13:10 | | | | | | | | | |
| Matrix: WS | | | | | | | | | |
| Dissolved Metals in Water | | | | | | | | | |
| Dissolved Metals in Water by CRC ICPMS | | | | | | | | | |
| | | Dissolved Metals Filtration Location | LAB | | | | | 26-MAY-19 | EM2 |
| | | Aluminum (Al)-Dissolved | <0.0030 | | 0.003 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Antimony (Sb)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Arsenic (As)-Dissolved | 0.00011 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Barium (Ba)-Dissolved | 0.106 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Bismuth (Bi)-Dissolved | <0.000050 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Boron (B)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Cadmium (Cd)-Dissolved | 0.0000078 | | 0.000005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Calcium (Ca)-Dissolved | 63.1 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Chromium (Cr)-Dissolved | 0.00011 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Cobalt (Co)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|--------------------------|---|------------|-----------|----------|-------|-----------|-----------|------|
| L2278104-5 | RG_EROL_WS_20190522-1310 | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 13:10 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Dissolved Metals in Water | | | | | | | |
| | | Dissolved Metals in Water by CRC ICPMS | | | | | | | |
| | | Copper (Cu)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Iron (Fe)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Lead (Pb)-Dissolved | <0.000050 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Lithium (Li)-Dissolved | 0.0051 | | 0.001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Magnesium (Mg)-Dissolved | 15.1 | | 0.1 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Manganese (Mn)-Dissolved | 0.00170 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Molybdenum (Mo)-Dissolved | 0.000717 | | 0.00005 | mg/L | 26-MAY-19 | 28-MAY-19 | ACYH |
| | | Nickel (Ni)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Potassium (K)-Dissolved | 0.529 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Selenium (Se)-Dissolved | 0.00339 | | 0.00005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Silicon (Si)-Dissolved | 2.28 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Silver (Ag)-Dissolved | <0.000010 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Sodium (Na)-Dissolved | 3.69 | | 0.05 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Strontium (Sr)-Dissolved | 0.188 | | 0.0002 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Thallium (Tl)-Dissolved | <0.000010 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Tin (Sn)-Dissolved | <0.00010 | | 0.0001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Titanium (Ti)-Dissolved | <0.010 | | 0.01 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Uranium (U)-Dissolved | 0.000658 | | 0.00001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Vanadium (V)-Dissolved | <0.00050 | | 0.0005 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Zinc (Zn)-Dissolved | <0.0010 | | 0.001 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Diss. Mercury in Water by CVAAS or CVAFS | | | | | | | |
| | | Dissolved Mercury Filtration Location | LAB | | | | | 28-MAY-19 | EB3 |
| | | Mercury (Hg)-Dissolved | <0.0000050 | | 0.000005 | mg/L | 28-MAY-19 | 28-MAY-19 | EB3 |
| | | Diss. Be (low) in Water by CRC ICPMS | | | | | | | |
| | | Beryllium (Be)-Dissolved | <0.000020 | | 0.00002 | mg/L | 26-MAY-19 | 27-MAY-19 | MMS2 |
| | | Dissolved Metals Filtration Location | LAB | | | | | 26-MAY-19 | EM2 |
| | | Routine for Teck Coal | | | | | | | |
| | | Phosphorus (P)-Total | | | | | | | |
| | | Phosphorus (P)-Total | 0.0023 | | 0.002 | mg/L | | 29-MAY-19 | RZF |
| | | Ion Balance | 96.8 | | -100 | % | | 30-MAY-19 | |
| | | pH | 8.30 | | 0.1 | pH | | 30-MAY-19 | RMS |
| | | ORP | 365 | | -1000 | mV | | 28-MAY-19 | RGB |
| | | Turbidity | | | | | | | |
| | | Turbidity | 0.29 | | 0.1 | NTU | | 24-MAY-19 | RGB |
| | | Total Suspended Solids | | | | | | | |
| | | Total Suspended Solids | <1.0 | | 1 | mg/L | | 29-MAY-19 | EDT |
| | | Total Dissolved Solids | | | | | | | |
| | | Total Dissolved Solids | 221 | DLHC | 20 | mg/L | | 28-MAY-19 | LT2 |
| | | Sulfate in Water by IC | | | | | | | |
| | | Sulfate (SO4) | 30.3 | | 0.3 | mg/L | | 24-MAY-19 | RMS |
| | | Orthophosphate-Dissolved (as P) | | | | | | | |
| | | Orthophosphate-Dissolved (as P) | <0.0010 | | 0.001 | mg/L | | 24-MAY-19 | RZF |
| | | Nitrite in Water by IC (Low Level) | | | | | | | |
| | | Nitrite (as N) | 0.0016 | | 0.001 | mg/L | | 24-MAY-19 | RMS |
| | | Nitrate in Water by IC (Low Level) | | | | | | | |
| | | Nitrate (as N) | 0.341 | | 0.005 | mg/L | | 24-MAY-19 | RMS |
| | | Ion Balance Calculation | | | | | | | |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|--------------------------|---|-----------|-----------|----------|-------|-----------|-----------|-----|
| L2278104-5 | RG_EROL_WS_20190522-1310 | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 13:10 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Routine for Teck Coal | | | | | | | |
| | | Ion Balance Calculation | | | | | | | |
| | | Cation - Anion Balance | -1.6 | | | % | | 30-MAY-19 | |
| | | Anion Sum | 4.72 | | | meq/L | | 30-MAY-19 | |
| | | Cation Sum | 4.56 | | | meq/L | | 30-MAY-19 | |
| | | Fluoride in Water by IC | | | | | | | |
| | | Fluoride (F) | 0.129 | | 0.02 | mg/L | | 24-MAY-19 | RMS |
| | | Electrical Conductivity (EC) | | | | | | | |
| | | Conductivity (@ 25C) | 412 | | 2 | uS/cm | | 30-MAY-19 | RMS |
| | | Chloride in Water by IC | | | | | | | |
| | | Chloride (Cl) | 3.48 | | 0.5 | mg/L | | 24-MAY-19 | RMS |
| | | Bromide in Water by IC (Low Level) | | | | | | | |
| | | Bromide (Br) | <0.050 | | 0.05 | mg/L | | 24-MAY-19 | RMS |
| | | Ammonia, Total (as N) | | | | | | | |
| | | Ammonia as N | 0.0099 | | 0.005 | mg/L | | 31-MAY-19 | LWY |
| | | Alkalinity (Species) by Manual Titration | | | | | | | |
| | | Alkalinity, Bicarbonate (as CaCO3) | 198 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Carbonate (as CaCO3) | <1.0 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Hydroxide (as CaCO3) | <1.0 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Alkalinity, Total (as CaCO3) | 198 | | 1 | mg/L | | 30-MAY-19 | RMS |
| | | Acidity by Automatic Titration | | | | | | | |
| | | Acidity (as CaCO3) | <1.0 | | 1 | mg/L | | 29-MAY-19 | CH3 |
| | | Total Kjeldahl Nitrogen | 0.087 | | 0.05 | mg/L | | 31-MAY-19 | SCL |
| | | Total Organic Carbon | 1.42 | | 0.5 | mg/L | | 28-MAY-19 | HSC |
| | | Dissolved Organic Carbon | 1.18 | | 0.5 | mg/L | | 28-MAY-19 | HSC |
| | | Mercury (Hg)-Total | <0.00050 | | 0.0005 | ug/L | | 28-MAY-19 | MA2 |
| | | Total Metals in Water | | | | | | | |
| | | Total Metals in Water by CRC ICPMS | | | | | | | |
| | | Aluminum (Al)-Total | 0.0035 | | 0.003 | mg/L | | 27-MAY-19 | LVD |
| | | Antimony (Sb)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Arsenic (As)-Total | 0.00020 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Barium (Ba)-Total | 0.109 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Bismuth (Bi)-Total | <0.000050 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Boron (B)-Total | <0.010 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Cadmium (Cd)-Total | 0.0000061 | | 0.000005 | mg/L | | 27-MAY-19 | LVD |
| | | Calcium (Ca)-Total | 63.2 | | 0.05 | mg/L | | 27-MAY-19 | LVD |
| | | Chromium (Cr)-Total | 0.00053 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Cobalt (Co)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Copper (Cu)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Iron (Fe)-Total | 0.017 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Lead (Pb)-Total | <0.000050 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Lithium (Li)-Total | 0.0050 | | 0.001 | mg/L | | 27-MAY-19 | LVD |
| | | Magnesium (Mg)-Total | 15.5 | | 0.1 | mg/L | | 27-MAY-19 | LVD |
| | | Manganese (Mn)-Total | 0.00364 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Molybdenum (Mo)-Total | 0.000699 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |
| | | Nickel (Ni)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Potassium (K)-Total | 0.523 | | 0.05 | mg/L | | 27-MAY-19 | LVD |
| | | Selenium (Se)-Total | 0.00299 | | 0.00005 | mg/L | | 27-MAY-19 | LVD |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|--------------------------------|---|-----------|-----------|---------|-------|-----------|-----------|-----|
| L2278104-5 | RG_EROL_WS_20190522-1310 | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 13:10 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Total Metals in Water | | | | | | | |
| | | Total Metals in Water by CRC ICPMS | | | | | | | |
| | | Silicon (Si)-Total | 2.12 | | 0.1 | mg/L | | 27-MAY-19 | LVD |
| | | Silver (Ag)-Total | <0.000010 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Sodium (Na)-Total | 3.26 | | 0.05 | mg/L | | 27-MAY-19 | LVD |
| | | Strontium (Sr)-Total | 0.166 | | 0.0002 | mg/L | | 27-MAY-19 | LVD |
| | | Thallium (Tl)-Total | <0.000010 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Tin (Sn)-Total | <0.00010 | | 0.0001 | mg/L | | 27-MAY-19 | LVD |
| | | Titanium (Ti)-Total | <0.010 | | 0.01 | mg/L | | 27-MAY-19 | LVD |
| | | Uranium (U)-Total | 0.000634 | | 0.00001 | mg/L | | 27-MAY-19 | LVD |
| | | Vanadium (V)-Total | <0.00050 | | 0.0005 | mg/L | | 27-MAY-19 | LVD |
| | | Zinc (Zn)-Total | <0.0030 | | 0.003 | mg/L | | 27-MAY-19 | LVD |
| | | Total Be (Low) in Water by CRC ICPMS | | | | | | | |
| | | Beryllium (Be)-Total | <0.000020 | | 0.00002 | mg/L | | 27-MAY-19 | LVD |
| | | Hardness | | | | | | | |
| | | Hardness (as CaCO3) | 220 | | 0.5 | mg/L | | 28-MAY-19 | |
| L2278104-6 | RG_EROL_WS_20190522-1310_FB-HG | | | | | | | | |
| | | Sample Date: CLIENT on 22-MAY-19 @ 13:10 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Mercury (Hg)-Total | <0.00050 | | 0.0005 | ug/L | | 28-MAY-19 | MA2 |

Methodology Reference

| ALS Test Code | Test Description | Methodology Reference (In-House Standard Operating Procedures which Generally Follow:) |
|--------------------|--|--|
| ACIDITY-PCT-CL | Acidity by Automatic Titration | APHA 2310 Acidity |
| NO2-L-IC-N-CL | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| NO3-L-IC-N-CL | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| F-IC-N-CL | Fluoride in Water by IC | EPA 300.1 (mod) |
| HARDNESS-CALC-VA | Hardness | APHA 2340B |
| HG-D-CVAA-VA | Diss. Mercury in Water by CVAAS or CVAFS | APHA 3030B/EPA 1631E (mod) |
| PH-CL | pH | APHA 4500 H-Electrode |
| PO4-DO-L-COL-CL | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| SO4-IC-N-CL | Sulfate in Water by IC | EPA 300.1 (mod) |
| CL-IC-N-CL | Chloride in Water by IC | EPA 300.1 (mod) |
| TSS-L-CL | Total Suspended Solids | APHA 2540 D-Gravimetric |
| BE-D-L-CCMS-VA | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| BR-L-IC-N-CL | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| EC-L-PCT-CL | Electrical Conductivity (EC) | APHA 2510B |
| ALK-MAN-CL | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| BE-T-L-CCMS-VA | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| MET-D-CCMS-VA | Dissolved Metals in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| MET-T-CCMS-VA | Total Metals in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| SOLIDS-TDS-CL | Total Dissolved Solids | APHA 2540 C |
| TKN-L-F-CL | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| ORP-CL | Oxidation reduction potential by elect. | ASTM D1498 |
| P-T-L-COL-CL | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| TECKCOAL-IONBAL-CL | Ion Balance Calculation | APHA 1030E |
| C-DIS-ORG-LOW-CL | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| TURBIDITY-CL | Turbidity | APHA 2130 B-Nephelometer |
| C-TOT-ORG-LOW-CL | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| HG-T-U-CVAF-VA | Total Mercury in Water by CVAFS (Ultra) | EPA 1631 REV. E |
| IONBALANCE-BC-CL | Ion Balance Calculation | APHA 1030E |
| NH3-L-F-CL | Ammonia, Total (as N) | J. ENVIRON. MONIT., 2005, 7, 37-42, RSC |

Sample Parameter Qualifier key listed:

| Qualifier | Description |
|-----------|---|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |

COC ID: 1912 Leach's Lamp Monitoring Study for SRA

TURNAROUND TIME:

LABORATORY

Facility Name / Job: Regional Effects Program (REP)

Project Manager: Carl Good

Address: 421 Pine Avenue

City: Sparwood

Postal Code: V0B 2G0

Phone Number: 250-431-8202

Lab Name: ALS Calgary

Lab Contact: Lyndia Stevens

Email: lyndia.stevens@alslab.com

Address: 2539 29 Street NE

City: Calgary

Postal Code: T1V 7B5

Phone Number: 1-403-407-1794

Province: BC / Country: Canada

Province: AB / Country: Canada

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G-Grab C-Comp | # Of Cont. | ANALYSIS REQUESTED | DATE/TIME | ACCEPTED BY/AFFILIATION |
|----------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|------------|--------------------|-----------|-------------------------|
| RG-LNLK-WS-20190502-1055 | RG-LNLK | WS | No | 22-May-19 | 10:55 | G | 1 | TECKCOAL-ROUTINE | 5/23 | |
| RG-LNLK-WS-20190502-1057 | RG-LNLK | WS | No | 22-May-19 | 10:57 | G | 1 | TECKCOAL-MET-T | 5/23 | |
| RG-ISKAND-WS-20190502-0757 | RG-ISKAND | WS | No | 22-May-19 | 07:57 | G | 1 | TECKCOAL-MET-D | 5/23 | |
| RG-ISKAND-WS-20190502-0816 | RG-ISKAND | WS | No | 22-May-19 | 08:16 | G | 1 | TECKCOAL-MET-T | 5/23 | |
| RG-ERL-WS-20190502-1310 | RG-ERL | WS | No | 22-May-19 | 13:10 | G | 1 | TECKCOAL-MET-T | 5/23 | |
| RG-ERL-WS-20190502-1310 | RG-ERL | WS | No | 22-May-19 | 13:10 | G | 1 | TECKCOAL-MET-D | 5/23 | |



ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RG-ERL-WS-20190502-1310

WSPR which Amber bottle had preservative added please check JOC / P&DC.

REGULAR (default) x

PRIORITY (2-3 business days) - 50% surcharge

EMERGENCY (1 Business Day) - 100% surcharge

For Emergency <1 Day, ASAP on Weekend - Contact ALS

Sampler's Name: [Signature]

Sampler's Signature: [Signature]

Mobile #: [Blank]

Date/Time: [Blank]

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Some of Total & Dissolved Metals WSPR which sample had preservative added



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 24-MAY-19
Report Date: 04-JUN-19 16:29 (MT)
Version: FINAL REV. 2

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2279040
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-12 - 5
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2279040-1 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 | L2279040-2 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 FB- HG | | |
|-----------------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 1070 | | | |
| | Hardness (as CaCO3) (mg/L) | 564 | | | |
| | pH (pH) | 8.29 | | | |
| | ORP (mV) | 427 | | | |
| | Total Suspended Solids (mg/L) | 4.7 | | | |
| | Total Dissolved Solids (mg/L) | 694 | DLHC | | |
| | Turbidity (NTU) | 7.34 | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | 1.7 | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 241 | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | 241 | | | |
| | Ammonia as N (mg/L) | 0.0108 | | | |
| | Bromide (Br) (mg/L) | 0.27 | DLHC | | |
| | Chloride (Cl) (mg/L) | 36.1 | DLHC | | |
| | Fluoride (F) (mg/L) | 0.18 | DLHC | | |
| | Ion Balance (%) | 91.2 | | | |
| | Nitrate (as N) (mg/L) | 1.05 | DLHC | | |
| | Nitrite (as N) (mg/L) | <0.0050 | DLHC | | |
| | Total Kjeldahl Nitrogen (mg/L) | 0.094 | TKNI | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | | | |
| | Phosphorus (P)-Total (mg/L) | 0.0038 | | | |
| | Sulfate (SO4) (mg/L) | 334 | DLHC | | |
| | Anion Sum (meq/L) | 12.9 | | | |
| | Cation Sum (meq/L) | 11.7 | | | |
| | Cation - Anion Balance (%) | -4.6 | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 0.74 | | | |
| | Total Organic Carbon (mg/L) | 0.78 | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0371 | | | |
| | Antimony (Sb)-Total (mg/L) | 0.00042 | | | |
| | Arsenic (As)-Total (mg/L) | 0.00022 | | | |
| | Barium (Ba)-Total (mg/L) | 0.101 | | | |
| | Beryllium (Be)-Total (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | | | |
| | Boron (B)-Total (mg/L) | 0.029 | | | |
| | Cadmium (Cd)-Total (ug/L) | 0.0081 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2279040-1 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 | L2279040-2 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 FB- HG | | |
|-------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | 121 | | | |
| | Chromium (Cr)-Total (mg/L) | 0.00011 | | | |
| | Cobalt (Co)-Total (ug/L) | <0.10 | | | |
| | Copper (Cu)-Total (mg/L) | <0.00050 | | | |
| | Iron (Fe)-Total (mg/L) | 0.074 | | | |
| | Lead (Pb)-Total (mg/L) | <0.000050 | | | |
| | Lithium (Li)-Total (mg/L) | 0.0293 | | | |
| | Magnesium (Mg)-Total (mg/L) | 71.1 | | | |
| | Manganese (Mn)-Total (mg/L) | 0.0157 | | | |
| | Mercury (Hg)-Total (ug/L) | 0.00060 | <0.00050 | | |
| | Molybdenum (Mo)-Total (mg/L) | 0.00231 | | | |
| | Nickel (Ni)-Total (mg/L) | 0.00104 | | | |
| | Potassium (K)-Total (mg/L) | 1.94 | | | |
| | Selenium (Se)-Total (ug/L) | 69.8 | | | |
| | Silicon (Si)-Total (mg/L) | 2.90 | | | |
| | Silver (Ag)-Total (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Total (mg/L) | 8.99 | | | |
| | Strontium (Sr)-Total (mg/L) | 0.424 | | | |
| | Thallium (Tl)-Total (mg/L) | 0.000013 | | | |
| | Tin (Sn)-Total (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Total (mg/L) | <0.010 | | | |
| | Uranium (U)-Total (mg/L) | 0.00348 | | | |
| | Vanadium (V)-Total (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Total (mg/L) | 0.0045 | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | LAB | | | |
| | Dissolved Metals Filtration Location | LAB | | | |
| | Aluminum (Al)-Dissolved (mg/L) | 0.0049 | | | |
| | Antimony (Sb)-Dissolved (mg/L) | 0.00044 | | | |
| | Arsenic (As)-Dissolved (mg/L) | 0.00016 | | | |
| | Barium (Ba)-Dissolved (mg/L) | 0.0990 | | | |
| | Beryllium (Be)-Dissolved (ug/L) | <0.020 | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | <0.000050 | | | |
| | Boron (B)-Dissolved (mg/L) | 0.024 | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | <0.0050 | | | |
| | Calcium (Ca)-Dissolved (mg/L) | 119 | | | |
| | Chromium (Cr)-Dissolved (mg/L) | <0.00010 | | | |
| | Cobalt (Co)-Dissolved (ug/L) | <0.10 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2279040-1 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 | L2279040-2 WS 23-MAY-19 09:00 RG_GO13_WS_20 190523-0900 FB- HG | | |
|-------------------------|--|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | | | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | 0.0294 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 64.9 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.0105 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00228 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00100 | | | |
| | Potassium (K)-Dissolved (mg/L) | 2.07 | | | |
| | Selenium (Se)-Dissolved (ug/L) | 86.6 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 2.78 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | 9.59 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.418 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | 0.000011 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.00347 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC, DIS METALS LAB FILTERED/PRESERVED |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Silicon (Si)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2279040-1 |
| Matrix Spike | Aluminum (Al)-Total | MS-B | L2279040-1 |
| Matrix Spike | Arsenic (As)-Total | MS-B | L2279040-1 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2279040-1 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2279040-1 |
| Matrix Spike | Iron (Fe)-Total | MS-B | L2279040-1 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2279040-1 |
| Matrix Spike | Manganese (Mn)-Total | MS-B | L2279040-1 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2279040-1 |
| Matrix Spike | Titanium (Ti)-Total | MS-B | L2279040-1 |
| Matrix Spike | Ammonia as N | MS-B | L2279040-1 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| TKNI | TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The | | | |

Reference Information

carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

Reference Information

| | | | |
|---|-------|--|--------------------------|
| NO2-L-IC-N-CL | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-L-IC-N-CL | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| ORP-CL | Water | Oxidation redution potential by elect. | ASTM D1498 |
| This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV. | | | |
| It is recommended that this analysis be conducted in the field. | | | |
| P-T-L-COL-CL | Water | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. | | | |
| PH-CL | Water | pH | APHA 4500 H-Electrode |
| pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed) | | | |
| PO4-DO-L-COL-CL | Water | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| SO4-IC-N-CL | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| SOLIDS-TDS-CL | Water | Total Dissolved Solids | APHA 2540 C |
| A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS). | | | |
| TECKCOAL-IONBAL-CL | Water | Ion Balance Calculation | APHA 1030E |
| Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero. | | | |
| Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as: | | | |
| Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum] | | | |
| TKN-L-F-CL | Water | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| TSS-L-CL | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C. | | | |
| TURBIDITY-CL | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-Lentic 19-12 - 5

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4653065 | | | | | | | |
| WG3063812-11 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 106.0 | | % | | 85-115 | 30-MAY-19 |
| WG3063812-10 | MB | | | | | | | |
| Acidity (as CaCO3) | | | <1.0 | | mg/L | | 2 | 30-MAY-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4653055 | | | | | | | |
| WG3063840-11 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 99.3 | | % | | 85-115 | 30-MAY-19 |
| WG3063840-10 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 30-MAY-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4646589 | | | | | | | |
| WG3058816-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 98.1 | | % | | 80-120 | 28-MAY-19 |
| WG3058816-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 28-MAY-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645810 | | | | | | | |
| WG3059574-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 97.8 | | % | | 80-120 | 28-MAY-19 |
| WG3059574-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 28-MAY-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644755 | | | | | | | |
| WG3059401-10 | LCS | | | | | | | |
| Bromide (Br) | | | 99.2 | | % | | 85-115 | 24-MAY-19 |
| WG3059401-9 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 24-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4651166 | | | | | | | |
| WG3062909-6 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 84.4 | | % | | 80-120 | 29-MAY-19 |
| WG3062909-5 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 29-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|--------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| C-TOT-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4651166 | | | | | | | |
| WG3062909-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 88.0 | | % | | 80-120 | 29-MAY-19 |
| WG3062909-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 29-MAY-19 |
| CL-IC-N-CL | Water | | | | | | | |
| Batch | R4644755 | | | | | | | |
| WG3059401-10 | LCS | | | | | | | |
| Chloride (Cl) | | | 99.2 | | % | | 90-110 | 24-MAY-19 |
| WG3059401-9 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 24-MAY-19 |
| EC-L-PCT-CL | Water | | | | | | | |
| Batch | R4653055 | | | | | | | |
| WG3063840-11 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 103.9 | | % | | 90-110 | 30-MAY-19 |
| WG3063840-10 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 30-MAY-19 |
| F-IC-N-CL | Water | | | | | | | |
| Batch | R4644755 | | | | | | | |
| WG3059401-10 | LCS | | | | | | | |
| Fluoride (F) | | | 102.3 | | % | | 90-110 | 24-MAY-19 |
| WG3059401-9 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 24-MAY-19 |
| HG-D-CVAA-VA | Water | | | | | | | |
| Batch | R4650432 | | | | | | | |
| WG3062778-7 | DUP | L2279040-1 | | | | | | |
| Mercury (Hg)-Dissolved | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 30-MAY-19 |
| WG3062778-6 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 100.7 | | % | | 80-120 | 30-MAY-19 |
| WG3062778-5 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 30-MAY-19 |
| HG-T-U-CVAF-VA | Water | | | | | | | |
| Batch | R4652963 | | | | | | | |
| WG3064149-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 88.8 | | % | | 80-120 | 31-MAY-19 |
| WG3064149-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 31-MAY-19 |
| MET-D-CCMS-VA | Water | | | | | | | |



Quality Control Report

Workorder: L2279040

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|----------|-----------|-------|-----|--------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4646589 | | | | | | | |
| WG3058816-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 107.7 | | % | | 80-120 | 28-MAY-19 |
| Antimony (Sb)-Dissolved | | | 95.7 | | % | | 80-120 | 28-MAY-19 |
| Arsenic (As)-Dissolved | | | 100.7 | | % | | 80-120 | 28-MAY-19 |
| Barium (Ba)-Dissolved | | | 107.3 | | % | | 80-120 | 28-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 101.5 | | % | | 80-120 | 28-MAY-19 |
| Boron (B)-Dissolved | | | 94.1 | | % | | 80-120 | 28-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 102.1 | | % | | 80-120 | 28-MAY-19 |
| Calcium (Ca)-Dissolved | | | 97.7 | | % | | 80-120 | 28-MAY-19 |
| Chromium (Cr)-Dissolved | | | 103.0 | | % | | 80-120 | 28-MAY-19 |
| Cobalt (Co)-Dissolved | | | 101.6 | | % | | 80-120 | 28-MAY-19 |
| Iron (Fe)-Dissolved | | | 99.96 | | % | | 80-120 | 28-MAY-19 |
| Lead (Pb)-Dissolved | | | 102.9 | | % | | 80-120 | 28-MAY-19 |
| Lithium (Li)-Dissolved | | | 95.9 | | % | | 80-120 | 28-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 97.6 | | % | | 80-120 | 28-MAY-19 |
| Manganese (Mn)-Dissolved | | | 105.3 | | % | | 80-120 | 28-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 99.0 | | % | | 80-120 | 28-MAY-19 |
| Nickel (Ni)-Dissolved | | | 100.8 | | % | | 80-120 | 28-MAY-19 |
| Potassium (K)-Dissolved | | | 110.4 | | % | | 80-120 | 28-MAY-19 |
| Selenium (Se)-Dissolved | | | 100.3 | | % | | 80-120 | 28-MAY-19 |
| Silicon (Si)-Dissolved | | | 108.7 | | % | | 60-140 | 28-MAY-19 |
| Silver (Ag)-Dissolved | | | 98.8 | | % | | 80-120 | 28-MAY-19 |
| Sodium (Na)-Dissolved | | | 106.4 | | % | | 80-120 | 28-MAY-19 |
| Strontium (Sr)-Dissolved | | | 98.0 | | % | | 80-120 | 28-MAY-19 |
| Thallium (Tl)-Dissolved | | | 101.7 | | % | | 80-120 | 28-MAY-19 |
| Tin (Sn)-Dissolved | | | 98.9 | | % | | 80-120 | 28-MAY-19 |
| Titanium (Ti)-Dissolved | | | 99.97 | | % | | 80-120 | 28-MAY-19 |
| Uranium (U)-Dissolved | | | 100.9 | | % | | 80-120 | 28-MAY-19 |
| Vanadium (V)-Dissolved | | | 102.6 | | % | | 80-120 | 28-MAY-19 |
| Zinc (Zn)-Dissolved | | | 101.3 | | % | | 80-120 | 28-MAY-19 |
| WG3058816-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 28-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |



Quality Control Report

Workorder: L2279040

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4646589 | | | | | | | |
| WG3058816-1 | MB | LF | | | | | | |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 28-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 28-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 28-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 28-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 28-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 28-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 28-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 28-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 28-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 28-MAY-19 |
| Batch | R4647134 | | | | | | | |
| WG3061071-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 102.8 | | % | | 80-120 | 29-MAY-19 |
| Antimony (Sb)-Dissolved | | | 95.3 | | % | | 80-120 | 29-MAY-19 |
| Arsenic (As)-Dissolved | | | 101.8 | | % | | 80-120 | 29-MAY-19 |
| Barium (Ba)-Dissolved | | | 113.2 | | % | | 80-120 | 29-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 108.6 | | % | | 80-120 | 29-MAY-19 |
| Boron (B)-Dissolved | | | 98.5 | | % | | 80-120 | 29-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 104.2 | | % | | 80-120 | 29-MAY-19 |



Quality Control Report

Workorder: L2279040

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4647134 | | | | | | | |
| WG3061071-2 | LCS | | | | | | | |
| Calcium (Ca)-Dissolved | | | 103.9 | | % | | 80-120 | 29-MAY-19 |
| Chromium (Cr)-Dissolved | | | 105.4 | | % | | 80-120 | 29-MAY-19 |
| Cobalt (Co)-Dissolved | | | 103.3 | | % | | 80-120 | 29-MAY-19 |
| Copper (Cu)-Dissolved | | | 101.3 | | % | | 80-120 | 29-MAY-19 |
| Iron (Fe)-Dissolved | | | 96.2 | | % | | 80-120 | 29-MAY-19 |
| Lead (Pb)-Dissolved | | | 101.5 | | % | | 80-120 | 29-MAY-19 |
| Lithium (Li)-Dissolved | | | 100.0 | | % | | 80-120 | 29-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 102.2 | | % | | 80-120 | 29-MAY-19 |
| Manganese (Mn)-Dissolved | | | 103.7 | | % | | 80-120 | 29-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 104.4 | | % | | 80-120 | 29-MAY-19 |
| Nickel (Ni)-Dissolved | | | 101.7 | | % | | 80-120 | 29-MAY-19 |
| Potassium (K)-Dissolved | | | 106.3 | | % | | 80-120 | 29-MAY-19 |
| Selenium (Se)-Dissolved | | | 101.4 | | % | | 80-120 | 29-MAY-19 |
| Silicon (Si)-Dissolved | | | 104.7 | | % | | 60-140 | 29-MAY-19 |
| Silver (Ag)-Dissolved | | | 102.6 | | % | | 80-120 | 29-MAY-19 |
| Sodium (Na)-Dissolved | | | 107.0 | | % | | 80-120 | 29-MAY-19 |
| Strontium (Sr)-Dissolved | | | 101.6 | | % | | 80-120 | 29-MAY-19 |
| Thallium (Tl)-Dissolved | | | 101.5 | | % | | 80-120 | 29-MAY-19 |
| Tin (Sn)-Dissolved | | | 100.5 | | % | | 80-120 | 29-MAY-19 |
| Titanium (Ti)-Dissolved | | | 101.5 | | % | | 80-120 | 29-MAY-19 |
| Uranium (U)-Dissolved | | | 95.2 | | % | | 80-120 | 29-MAY-19 |
| Vanadium (V)-Dissolved | | | 107.1 | | % | | 80-120 | 29-MAY-19 |
| Zinc (Zn)-Dissolved | | | 100.9 | | % | | 80-120 | 29-MAY-19 |
| WG3061071-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 29-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 29-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |



Quality Control Report

Workorder: L2279040

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4647134 | | | | | | | |
| WG3061071-1 | MB | LF | | | | | | |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 29-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 29-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 29-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 29-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 29-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 29-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 29-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 29-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 29-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 29-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4645810 | | | | | | | |
| WG3059574-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 102.1 | | % | | 80-120 | 28-MAY-19 |
| Antimony (Sb)-Total | | | 101.9 | | % | | 80-120 | 28-MAY-19 |
| Arsenic (As)-Total | | | 100.4 | | % | | 80-120 | 28-MAY-19 |
| Barium (Ba)-Total | | | 103.0 | | % | | 80-120 | 28-MAY-19 |
| Bismuth (Bi)-Total | | | 99.0 | | % | | 80-120 | 28-MAY-19 |
| Boron (B)-Total | | | 93.5 | | % | | 80-120 | 28-MAY-19 |
| Cadmium (Cd)-Total | | | 100.0 | | % | | 80-120 | 28-MAY-19 |
| Calcium (Ca)-Total | | | 97.2 | | % | | 80-120 | 28-MAY-19 |
| Chromium (Cr)-Total | | | 100.6 | | % | | 80-120 | 28-MAY-19 |
| Cobalt (Co)-Total | | | 100.5 | | % | | 80-120 | 28-MAY-19 |
| Copper (Cu)-Total | | | 98.0 | | % | | 80-120 | 28-MAY-19 |



Quality Control Report

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4645810 | | | | | | | |
| WG3059574-2 | LCS | | | | | | | |
| Iron (Fe)-Total | | | 99.7 | | % | | 80-120 | 28-MAY-19 |
| Lead (Pb)-Total | | | 97.6 | | % | | 80-120 | 28-MAY-19 |
| Lithium (Li)-Total | | | 92.3 | | % | | 80-120 | 28-MAY-19 |
| Magnesium (Mg)-Total | | | 99.9 | | % | | 80-120 | 28-MAY-19 |
| Manganese (Mn)-Total | | | 100.9 | | % | | 80-120 | 28-MAY-19 |
| Molybdenum (Mo)-Total | | | 103.1 | | % | | 80-120 | 28-MAY-19 |
| Nickel (Ni)-Total | | | 99.2 | | % | | 80-120 | 28-MAY-19 |
| Potassium (K)-Total | | | 98.1 | | % | | 80-120 | 28-MAY-19 |
| Selenium (Se)-Total | | | 100.0 | | % | | 80-120 | 28-MAY-19 |
| Silicon (Si)-Total | | | 104.0 | | % | | 80-120 | 28-MAY-19 |
| Silver (Ag)-Total | | | 98.1 | | % | | 80-120 | 28-MAY-19 |
| Sodium (Na)-Total | | | 99.4 | | % | | 80-120 | 28-MAY-19 |
| Strontium (Sr)-Total | | | 95.5 | | % | | 80-120 | 28-MAY-19 |
| Thallium (Tl)-Total | | | 99.2 | | % | | 80-120 | 28-MAY-19 |
| Tin (Sn)-Total | | | 98.6 | | % | | 80-120 | 28-MAY-19 |
| Titanium (Ti)-Total | | | 94.5 | | % | | 80-120 | 28-MAY-19 |
| Uranium (U)-Total | | | 98.8 | | % | | 80-120 | 28-MAY-19 |
| Vanadium (V)-Total | | | 101.4 | | % | | 80-120 | 28-MAY-19 |
| Zinc (Zn)-Total | | | 99.6 | | % | | 80-120 | 28-MAY-19 |
| WG3059574-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 28-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 28-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 28-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 28-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 28-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 28-MAY-19 |



Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4645810 | | | | | | | |
| WG3059574-1 | MB | | | | | | | |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 28-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 28-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 28-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 28-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 28-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 28-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 28-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 28-MAY-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4653519 | | | | | | | |
| WG3065030-10 | LCS | | | | | | | |
| Ammonia as N | | | 95.2 | | % | | 85-115 | 01-JUN-19 |
| WG3065030-9 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 01-JUN-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |
| Batch | R4644755 | | | | | | | |
| WG3059401-10 | LCS | | | | | | | |
| Nitrite (as N) | | | 102.1 | | % | | 90-110 | 24-MAY-19 |
| WG3059401-9 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 24-MAY-19 |
| NO3-L-IC-N-CL | | Water | | | | | | |
| Batch | R4644755 | | | | | | | |
| WG3059401-10 | LCS | | | | | | | |
| Nitrate (as N) | | | 99.4 | | % | | 90-110 | 24-MAY-19 |
| WG3059401-9 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 24-MAY-19 |
| ORP-CL | Water | | | | | | | |



Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| TKN-L-F-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4651431 | | | | | | | |
| WG3063294-5 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 96.7 | | % | | 75-125 | 30-MAY-19 |
| WG3063294-7 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 93.0 | | % | | 75-125 | 30-MAY-19 |
| WG3063294-1 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| WG3063294-4 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| WG3063294-6 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| TSS-L-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4652806 | | | | | | | |
| WG3063292-2 | LCS | | | | | | | |
| Total Suspended Solids | | | 93.4 | | % | | 85-115 | 30-MAY-19 |
| WG3063292-1 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 30-MAY-19 |
| TURBIDITY-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4644231 | | | | | | | |
| WG3058720-3 | DUP | L2279040-1 | | | | | | |
| Turbidity | | 7.34 | 7.29 | | NTU | 0.7 | 15 | 25-MAY-19 |
| WG3058720-2 | LCS | | | | | | | |
| Turbidity | | | 96.5 | | % | | 85-115 | 25-MAY-19 |
| WG3058720-1 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 25-MAY-19 |

Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2279040

Report Date: 04-JUN-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|---|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation reduction potential by elect. | 1 | 23-MAY-19 09:00 | 29-MAY-19 15:10 | 0.25 | 150 | hours | EHTR-FM |
| pH | 1 | 23-MAY-19 09:00 | 30-MAY-19 16:00 | 0.25 | 175 | hours | EHTR-FM |

Legend & Qualifier Definitions:

| | |
|----------|---|
| EHTR-FM: | Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended. |
| EHTR: | Exceeded ALS recommended hold time prior to sample receipt. |
| EHTL: | Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry. |
| EHT: | Exceeded ALS recommended hold time prior to analysis. |
| Rec. HT: | ALS recommended hold time (see units). |

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.

Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2279040 were received on 24-MAY-19 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

COC ID: 19-12 Lentic Area Supporting Study For Study

TURNAROUND TIME:

| PROJECT/CLIENT INFO | | | | LABORATORY | | | |
|----------------------|--------------------------------|----------|--------|--------------|-------------------------------|----------|--------|
| Facility Name / Job# | Regional Effects Program (REP) | | | Lab Name | ALS Calgary | | |
| Project Manager | Cait Good | | | Lab Contact | Lyudmyla Shvets | | |
| Email | cait.good@teck.com | | | Email | lyudmyla.shvets@alsglobal.com | | |
| Address | 421 Pine Avenue | | | Address | 2559 29 Street NE | | |
| City | Sparwood | Province | BC | City | Calgary | Province | AB |
| Postal Code | V0B 2G0 | Country | Canada | Postal Code | T1Y 7B5 | Country | Canada |
| Phone Number | 250-425-8202 | | | Phone Number | 1 403 407 1794 | | |

ds menick
@ mlanow
ca

SAMPLE DETAILS



L2279040-COFC

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G-Grab C-Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-BOC | ALS_Package-TRN/FOC | HC-T-ELCVAR-VA | HC-D-CVAR-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA |
|--------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|---------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|
| RG_0013_WS-20190523-0700 | RG-6013 | WS | No | 23-May-19 | 0900 | G | 2 | X | X | X | X | X | X | X |
| RG_6013_WS-20190523-0700 | FB-HG RG-6013 | WS | No | 23-May-19 | 0900 | G | 1 | | | | X | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |
| | | | No | | | | | | | | | | | |

ANALYSIS REQUESTED

| N | N | N | N | N | N | N |
|---|---|-------|---|---|-------|---|
| | | H2504 | | | H2503 | |

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

| | | | |
|--|-----------------------------|-----------|------------------------------|
| | RELINQUISHED BY/AFFILIATION | DATE/TIME | ACCEPTED BY/AFFILIATION |
| | | | <i>[Signature]</i> 5/24 9:05 |

| NB OF BOTTLES RETURNED/DESCRIPTION | Sampler's Name | Mobile # |
|---|---------------------|-----------|
| Regular (default) x | | |
| Priority (2-3 business days) - 50% surcharge | | |
| Emergency (1 Business Day) - 100% surcharge | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | Sampler's Signature | Date/Time |

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Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 28-MAY-19
Report Date: 05-JUN-19 08:39 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2280498
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REDSIDE SHINER
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2280498-1 | L2280498-2 | L2280498-3 | L2280498-4 | L2280498-5 |
|-----------------------------|---|---------------------------------|------------------------------|-------------------------------|------------------------------|--------------------------------|------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 |
| | | Sampled Time | 10:45 | 12:40 | 14:00 | 14:30 | 14:30 |
| | | Client ID | RG_GO13_WS_20 190527-1045 | RG_ERWSF_WS_ 20190527-1240 | RG_STPD_WS_20 190527-1400 | RG_FBLANK_WS_ 20190527-1430 | RG_TRIP_WS_201 90527-1430 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 1030 | 491 | 407 | <2.0 | <2.0 |
| | Hardness (as CaCO3) (mg/L) | | 574 | 233 | 215 | <0.50 | |
| | pH (pH) | | 8.20 | 8.15 | 8.15 | 4.26 | 4.31 |
| | ORP (mV) | | 273 | 442 | 448 | 489 | 456 |
| | Total Suspended Solids (mg/L) | | 8.1 | 9.8 | 1.9 | <1.0 | <1.0 |
| | Total Dissolved Solids (mg/L) | | 723 ^{DLHC} | 280 ^{DLHC} | 234 ^{DLHC} | <10 | <10 |
| | Turbidity (NTU) | | 16.8 | 5.12 | 0.75 | <0.10 | <0.10 |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 4.2 | 2.6 | 1.6 | 1.5 | 2.2 |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 230 | 205 | 155 | <1.0 | <1.0 |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 230 | 205 | 155 | <1.0 | <1.0 |
| | Ammonia as N (mg/L) | | 0.0098 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| | Bromide (Br) (mg/L) | | 0.218 | <0.050 | <0.050 | <0.050 | <0.050 |
| | Chloride (Cl) (mg/L) | | 32.0 | 30.6 | 2.86 | <0.50 | <0.50 |
| | Fluoride (F) (mg/L) | | 0.170 | 0.087 | 0.159 | <0.020 | <0.020 |
| | Ion Balance (%) | | 101 | 105 | 98.9 | 0.0 | 0.0 |
| | Nitrate (as N) (mg/L) | | 0.786 | 0.0591 | 0.596 | <0.0050 | <0.0050 |
| | Nitrite (as N) (mg/L) | | 0.0033 | 0.0018 | 0.0070 | <0.0010 | <0.0010 |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.196 | 0.270 | 0.314 | <0.050 | <0.050 |
| | Orthophosphate-Dissolved (as P) (mg/L) | | 0.0017 | 0.0026 | 0.0015 | <0.0010 | <0.0010 |
| | Phosphorus (P)-Total (mg/L) | | 0.0136 | 0.0233 | 0.0082 | <0.0020 | <0.0020 |
| | Sulfate (SO4) (mg/L) | | 300 | 10.1 | 60.9 | <0.30 | <0.30 |
| | Anion Sum (meq/L) | | 11.8 | 5.18 | 4.50 | <0.10 | <0.10 |
| | Cation Sum (meq/L) | | 11.9 | 5.42 | 4.45 | <0.10 | <0.10 |
| | Cation - Anion Balance (%) | | 0.6 | 2.3 | -0.6 | 0.0 | 0.0 |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 1.64 | 3.40 | 0.91 | <0.50 |
| Total Organic Carbon (mg/L) | | | 1.74 | 3.36 | 0.97 | <0.50 | <0.50 |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.133 | 0.0373 | 0.0126 | <0.0030 | <0.0030 |
| | Antimony (Sb)-Total (mg/L) | | 0.00034 | 0.00014 | 0.00011 | <0.00010 | <0.00010 |
| | Arsenic (As)-Total (mg/L) | | 0.00027 | 0.00053 | 0.00017 | <0.00010 | <0.00010 |
| | Barium (Ba)-Total (mg/L) | | 0.111 | 0.0524 | 0.0962 | <0.00010 | <0.00010 |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Boron (B)-Total (mg/L) | | 0.025 | 0.014 | <0.010 | <0.010 | <0.010 |
| | Cadmium (Cd)-Total (ug/L) | | 0.0163 | 0.0109 | 0.0074 | <0.0050 | <0.0050 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2280498-6 | L2280498-7 | L2280498-8 | L2280498-9 | L2280498-10 |
|-----------------------------|---|---------------------------------|----------------------------|----------------------------|------------------------------|-----------------------------|--|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 |
| | | Sampled Time | 12:00 | 14:00 | 15:30 | 15:45 | 10:45 |
| | | Client ID | RG_ER_WS_2019 0527-1200 | RG_GC_WS_2019 0527-1400 | RG_EROL_WS_20 190527-1530 | RG_DUP_WS_201 90527-1545 | RG_GO13_WS_20 190527-1045 FB- HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | 234 | 196 | 384 | 403 | |
| | Hardness (as CaCO3) (mg/L) | | 116 | 95.2 | 213 | 210 | |
| | pH (pH) | | 8.05 | 7.87 | 8.30 | 8.34 | |
| | ORP (mV) | | 371 | 406 | 396 | 383 | |
| | Total Suspended Solids (mg/L) | | 7.7 | 4.3 | <1.0 | 1.1 | |
| | Total Dissolved Solids (mg/L) | | 132 DLHC | 116 DLHC | 213 DLHC | 229 DLHC | |
| | Turbidity (NTU) | | 6.99 | 3.90 | 0.31 | 0.29 | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | 2.1 | 2.3 | 2.2 | 2.3 | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | 104 | 85.2 | 191 | 179 | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | <1.0 | <1.0 | <1.0 | 2.0 | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | <1.0 | <1.0 | <1.0 | <1.0 | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | 104 | 85.2 | 191 | 181 | |
| | Ammonia as N (mg/L) | | 0.0094 | <0.0050 | 0.0903 | 0.0057 | |
| | Bromide (Br) (mg/L) | | <0.050 | <0.050 | <0.050 | <0.050 | |
| | Chloride (Cl) (mg/L) | | 2.24 | 1.25 | 2.74 | 3.69 | |
| | Fluoride (F) (mg/L) | | 0.071 | 0.057 | 0.100 | 0.121 | |
| | Ion Balance (%) | | 94.4 | 98.8 | 103 | 99.0 | |
| | Nitrate (as N) (mg/L) | | 0.222 | 0.188 | 0.200 | 0.312 | |
| | Nitrite (as N) (mg/L) | | <0.0010 | <0.0010 | 0.0012 | 0.0015 | |
| | Total Kjeldahl Nitrogen (mg/L) | | 0.087 | 0.100 | 0.146 | 0.087 | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | <0.0010 | <0.0010 | <0.0010 | <0.0010 | |
| | Phosphorus (P)-Total (mg/L) | | 0.0077 | 0.0072 | 0.0078 | 0.0044 | |
| | Sulfate (SO4) (mg/L) | | 21.0 | 13.2 | 17.6 | 30.4 | |
| | Anion Sum (meq/L) | | 2.61 | 2.03 | 4.29 | 4.39 | |
| | Cation Sum (meq/L) | | 2.46 | 2.01 | 4.41 | 4.34 | |
| | Cation - Anion Balance (%) | | -2.9 | -0.6 | 1.4 | -0.5 | |
| | Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | 1.40 | 1.85 | 0.56 | 0.72 |
| Total Organic Carbon (mg/L) | | | 1.58 | 2.10 | 0.69 | 0.78 | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | 0.0885 | 0.0777 | 0.0081 | 0.0032 | |
| | Antimony (Sb)-Total (mg/L) | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | |
| | Arsenic (As)-Total (mg/L) | | 0.00042 | 0.00029 | 0.00014 | 0.00014 | |
| | Barium (Ba)-Total (mg/L) | | 0.0337 | 0.0378 | 0.108 | 0.107 | |
| | Beryllium (Be)-Total (ug/L) | | <0.020 | <0.020 | <0.020 | <0.020 | |
| | Bismuth (Bi)-Total (mg/L) | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | |
| | Boron (B)-Total (mg/L) | | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Cadmium (Cd)-Total (ug/L) | | 0.0095 | 0.0067 | 0.0091 | 0.0088 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | L2280498-11 WS 27-MAY-19 12:40 RG_ERWSF_WS_20190527-1240 FB-HG | L2280498-12 WS 27-MAY-19 14:00 RG_STPD_WS_20190527-1400 FB-HG | L2280498-13 WS 27-MAY-19 14:30 RG_FBLANK_WS_20190527-1430 FB-HG | L2280498-14 WS 27-MAY-19 12:00 RG_ER_WS_20190527-1200 FB-HG | L2280498-15 WS 27-MAY-19 14:00 RG_GC_WS_20190527-1400 FB-HG |
|---|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | | | | |
| | Hardness (as CaCO3) (mg/L) | | | | |
| | pH (pH) | | | | |
| | ORP (mV) | | | | |
| | Total Suspended Solids (mg/L) | | | | |
| | Total Dissolved Solids (mg/L) | | | | |
| | Turbidity (NTU) | | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | | | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | | | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | | | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | | | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | | | | |
| | Ammonia as N (mg/L) | | | | |
| | Bromide (Br) (mg/L) | | | | |
| | Chloride (Cl) (mg/L) | | | | |
| | Fluoride (F) (mg/L) | | | | |
| | Ion Balance (%) | | | | |
| | Nitrate (as N) (mg/L) | | | | |
| | Nitrite (as N) (mg/L) | | | | |
| | Total Kjeldahl Nitrogen (mg/L) | | | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | | | | |
| | Phosphorus (P)-Total (mg/L) | | | | |
| | Sulfate (SO4) (mg/L) | | | | |
| | Anion Sum (meq/L) | | | | |
| | Cation Sum (meq/L) | | | | |
| | Cation - Anion Balance (%) | | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | | | | |
| | Total Organic Carbon (mg/L) | | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | | | | |
| | Antimony (Sb)-Total (mg/L) | | | | |
| | Arsenic (As)-Total (mg/L) | | | | |
| | Barium (Ba)-Total (mg/L) | | | | |
| | Beryllium (Be)-Total (ug/L) | | | | |
| | Bismuth (Bi)-Total (mg/L) | | | | |
| | Boron (B)-Total (mg/L) | | | | |
| | Cadmium (Cd)-Total (ug/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2280498-16 WS 27-MAY-19 15:30 RG_EROL_WS_20 190527-1530 FB- HG | L2280498-17 WS 27-MAY-19 15:45 RG_DUP_WS_201 90527-1545 FB-HG | | |
|-----------------------------------|---|---|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) Hardness (as CaCO3) (mg/L) pH (pH) ORP (mV) Total Suspended Solids (mg/L) Total Dissolved Solids (mg/L) Turbidity (NTU) | | | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) Alkalinity, Bicarbonate (as CaCO3) (mg/L) Alkalinity, Carbonate (as CaCO3) (mg/L) Alkalinity, Hydroxide (as CaCO3) (mg/L) Alkalinity, Total (as CaCO3) (mg/L) Ammonia as N (mg/L) Bromide (Br) (mg/L) Chloride (Cl) (mg/L) Fluoride (F) (mg/L) Ion Balance (%) Nitrate (as N) (mg/L) Nitrite (as N) (mg/L) Total Kjeldahl Nitrogen (mg/L) Orthophosphate-Dissolved (as P) (mg/L) Phosphorus (P)-Total (mg/L) Sulfate (SO4) (mg/L) Anion Sum (meq/L) Cation Sum (meq/L) Cation - Anion Balance (%) | | | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) Total Organic Carbon (mg/L) | | | | |
| Total Metals | Aluminum (Al)-Total (mg/L) Antimony (Sb)-Total (mg/L) Arsenic (As)-Total (mg/L) Barium (Ba)-Total (mg/L) Beryllium (Be)-Total (ug/L) Bismuth (Bi)-Total (mg/L) Boron (B)-Total (mg/L) Cadmium (Cd)-Total (ug/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2280498-1 | L2280498-2 | L2280498-3 | L2280498-4 | L2280498-5 |
|-------------------------|---------------------------------------|--------------|------------------------------|-------------------------------|------------------------------|--------------------------------|------------------------------|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 |
| | | Sampled Time | 10:45 | 12:40 | 14:00 | 14:30 | 14:30 |
| | | Client ID | RG_GO13_WS_20 190527-1045 | RG_ERWSF_WS_ 20190527-1240 | RG_STPD_WS_20 190527-1400 | RG_FBLANK_WS_ 20190527-1430 | RG_TRIP_WS_201 90527-1430 |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 118 | 72.8 | 53.9 | <0.050 | <0.050 |
| | Chromium (Cr)-Total (mg/L) | | 0.00024 | 0.00033 | 0.00017 | <0.00010 | <0.00010 |
| | Cobalt (Co)-Total (ug/L) | | 0.15 | <0.10 | <0.10 | <0.10 | <0.10 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Iron (Fe)-Total (mg/L) | | 0.130 | 0.488 | 0.037 | <0.010 | <0.010 |
| | Lead (Pb)-Total (mg/L) | | 0.000110 | 0.000123 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Total (mg/L) | | 0.0302 | 0.0023 | 0.0062 | <0.0010 | <0.0010 |
| | Magnesium (Mg)-Total (mg/L) | | 71.9 | 15.3 | 18.0 | <0.10 | <0.10 |
| | Manganese (Mn)-Total (mg/L) | | 0.0340 | 0.00747 | 0.00469 | <0.00010 | <0.00010 |
| | Mercury (Hg)-Total (ug/L) | | 0.00131 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.00211 | 0.000479 | 0.000985 | <0.000050 | <0.000050 |
| | Nickel (Ni)-Total (mg/L) | | 0.00121 | 0.00078 | <0.00050 | <0.00050 | <0.00050 |
| | Potassium (K)-Total (mg/L) | | 2.07 | 1.37 | 0.476 | <0.050 | <0.050 |
| | Selenium (Se)-Total (ug/L) | | 62.4 | 0.611 | 6.29 | <0.050 | <0.050 |
| | Silicon (Si)-Total (mg/L) | | 2.76 | 2.65 | 1.11 | <0.10 | <0.10 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 9.35 | 16.9 | 3.27 | <0.050 | <0.050 |
| | Strontium (Sr)-Total (mg/L) | | 0.444 | 0.138 | 0.187 | <0.00020 | <0.00020 |
| | Thallium (Tl)-Total (mg/L) | | 0.000016 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.00311 | 0.000485 | 0.000930 | <0.000010 | <0.000010 |
| | Vanadium (V)-Total (mg/L) | | 0.00078 | 0.00067 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | <0.0030 | 0.0038 | <0.0030 | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | LAB | LAB | LAB | |
| | Dissolved Metals Filtration Location | | LAB | LAB | LAB | LAB | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | 0.0045 | 0.0033 | <0.0030 | <0.0030 | |
| | Antimony (Sb)-Dissolved (mg/L) | | 0.00032 | 0.00015 | <0.00010 | <0.00010 | |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00020 | 0.00046 | 0.00017 | <0.00010 | |
| | Barium (Ba)-Dissolved (mg/L) | | 0.102 | 0.0492 | 0.0932 | <0.00010 | |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | <0.020 | <0.020 | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | | 0.024 | 0.014 | <0.010 | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | | 0.0052 | 0.0053 | <0.0050 | <0.0050 | |
| | Calcium (Ca)-Dissolved (mg/L) | | 115 | 69.7 | 54.7 | <0.050 | <0.050 |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | 0.00021 | 0.00011 | <0.00010 | |
| | Cobalt (Co)-Dissolved (ug/L) | | 0.12 | <0.10 | <0.10 | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

05-JUN-19 08:39 (MT)

Version: FINAL

| | | Sample ID | L2280498-6 | L2280498-7 | L2280498-8 | L2280498-9 | L2280498-10 |
|-------------------------|---------------------------------------|--------------|----------------------------|----------------------------|------------------------------|-----------------------------|--|
| | | Description | WS | WS | WS | WS | WS |
| | | Sampled Date | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 |
| | | Sampled Time | 12:00 | 14:00 | 15:30 | 15:45 | 10:45 |
| | | Client ID | RG_ER_WS_2019 0527-1200 | RG_GC_WS_2019 0527-1400 | RG_EROL_WS_20 190527-1530 | RG_DUP_WS_201 90527-1545 | RG_GO13_WS_20 190527-1045 FB- HG |
| Grouping | Analyte | | | | | | |
| WATER | | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 30.3 | 24.6 | 62.4 | 58.4 | |
| | Chromium (Cr)-Total (mg/L) | | 0.00030 | 0.00017 | 0.00028 | 0.00025 | |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | <0.10 | <0.10 | <0.10 | |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | |
| | Iron (Fe)-Total (mg/L) | | 0.110 | 0.080 | 0.025 | 0.020 | |
| | Lead (Pb)-Total (mg/L) | | 0.000191 | 0.000105 | <0.000050 | <0.000050 | |
| | Lithium (Li)-Total (mg/L) | | 0.0014 | 0.0012 | 0.0039 | 0.0040 | |
| | Magnesium (Mg)-Total (mg/L) | | 9.45 | 7.96 | 15.2 | 15.1 | |
| | Manganese (Mn)-Total (mg/L) | | 0.0104 | 0.00797 | 0.00437 | 0.00384 | |
| | Mercury (Hg)-Total (ug/L) | | 0.00073 | 0.00097 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.000541 | 0.000361 | 0.000614 | 0.000619 | |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | |
| | Potassium (K)-Total (mg/L) | | 0.515 | 0.490 | 0.534 | 0.534 | |
| | Selenium (Se)-Total (ug/L) | | 0.544 | 0.570 | 2.52 | 2.68 | |
| | Silicon (Si)-Total (mg/L) | | 2.47 | 2.94 | 2.24 | 2.24 | |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | <0.000010 | <0.000010 | <0.000010 | |
| | Sodium (Na)-Total (mg/L) | | 2.92 | 1.93 | 3.20 | 3.14 | |
| | Strontium (Sr)-Total (mg/L) | | 0.127 | 0.0819 | 0.133 | 0.150 | |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | <0.000010 | <0.000010 | <0.000010 | |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Uranium (U)-Total (mg/L) | | 0.000650 | 0.000464 | 0.000514 | 0.000547 | |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | <0.00050 | <0.00050 | <0.00050 | |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | <0.0030 | 0.0059 | <0.0030 | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | LAB | LAB | LAB | |
| | Dissolved Metals Filtration Location | | LAB | LAB | LAB | LAB | |
| | Aluminum (Al)-Dissolved (mg/L) | | 0.0096 | 0.0115 | <0.0030 | <0.0030 | |
| | Antimony (Sb)-Dissolved (mg/L) | | <0.00010 | <0.00010 | <0.00010 | <0.00010 | |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00035 | 0.00027 | 0.00015 | 0.00014 | |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0316 | 0.0366 | 0.102 | 0.101 | |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | <0.020 | <0.020 | <0.020 | |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | <0.000050 | <0.000050 | <0.000050 | |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | <0.010 | <0.010 | <0.010 | |
| | Cadmium (Cd)-Dissolved (ug/L) | | <0.0050 | <0.0050 | 0.0071 | 0.0086 | |
| | Calcium (Ca)-Dissolved (mg/L) | | 30.8 | 25.2 | 61.0 | 61.0 | |
| | Chromium (Cr)-Dissolved (mg/L) | | <0.00010 | <0.00010 | 0.00024 | 0.00022 | |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | <0.10 | <0.10 | <0.10 | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2280498-11 WS 27-MAY-19 12:40 RG_ERWSF_WS_20190527-1240 FB-HG | L2280498-12 WS 27-MAY-19 14:00 RG_STPD_WS_20190527-1400 FB-HG | L2280498-13 WS 27-MAY-19 14:30 RG_FBLANK_WS_20190527-1430 FB-HG | L2280498-14 WS 27-MAY-19 12:00 RG_ER_WS_20190527-1200 FB-HG | L2280498-15 WS 27-MAY-19 14:00 RG_GC_WS_20190527-1400 FB-HG |
|-------------------------|---|---|--|--|--|--|
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | | | | |
| | Chromium (Cr)-Total (mg/L) | | | | | |
| | Cobalt (Co)-Total (ug/L) | | | | | |
| | Copper (Cu)-Total (mg/L) | | | | | |
| | Iron (Fe)-Total (mg/L) | | | | | |
| | Lead (Pb)-Total (mg/L) | | | | | |
| | Lithium (Li)-Total (mg/L) | | | | | |
| | Magnesium (Mg)-Total (mg/L) | | | | | |
| | Manganese (Mn)-Total (mg/L) | | | | | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Molybdenum (Mo)-Total (mg/L) | | | | | |
| | Nickel (Ni)-Total (mg/L) | | | | | |
| | Potassium (K)-Total (mg/L) | | | | | |
| | Selenium (Se)-Total (ug/L) | | | | | |
| | Silicon (Si)-Total (mg/L) | | | | | |
| | Silver (Ag)-Total (mg/L) | | | | | |
| | Sodium (Na)-Total (mg/L) | | | | | |
| | Strontium (Sr)-Total (mg/L) | | | | | |
| | Thallium (Tl)-Total (mg/L) | | | | | |
| | Tin (Sn)-Total (mg/L) | | | | | |
| | Titanium (Ti)-Total (mg/L) | | | | | |
| | Uranium (U)-Total (mg/L) | | | | | |
| | Vanadium (V)-Total (mg/L) | | | | | |
| | Zinc (Zn)-Total (mg/L) | | | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | | | |
| | Dissolved Metals Filtration Location | | | | | |
| | Aluminum (Al)-Dissolved (mg/L) | | | | | |
| | Antimony (Sb)-Dissolved (mg/L) | | | | | |
| | Arsenic (As)-Dissolved (mg/L) | | | | | |
| | Barium (Ba)-Dissolved (mg/L) | | | | | |
| | Beryllium (Be)-Dissolved (ug/L) | | | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | | | |
| | Boron (B)-Dissolved (mg/L) | | | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | | | |
| | Calcium (Ca)-Dissolved (mg/L) | | | | | |
| | Chromium (Cr)-Dissolved (mg/L) | | | | | |
| | Cobalt (Co)-Dissolved (ug/L) | | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2280498-16 WS 27-MAY-19 15:30 RG_EROL_WS_20 190527-1530 FB- HG | L2280498-17 WS 27-MAY-19 15:45 RG_DUP_WS_201 90527-1545 FB-HG | | |
|-------------------------|---|---|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | | | |
| | Chromium (Cr)-Total (mg/L) | | | | |
| | Cobalt (Co)-Total (ug/L) | | | | |
| | Copper (Cu)-Total (mg/L) | | | | |
| | Iron (Fe)-Total (mg/L) | | | | |
| | Lead (Pb)-Total (mg/L) | | | | |
| | Lithium (Li)-Total (mg/L) | | | | |
| | Magnesium (Mg)-Total (mg/L) | | | | |
| | Manganese (Mn)-Total (mg/L) | | | | |
| | Mercury (Hg)-Total (ug/L) | <0.00050 | <0.00050 | | |
| | Molybdenum (Mo)-Total (mg/L) | | | | |
| | Nickel (Ni)-Total (mg/L) | | | | |
| | Potassium (K)-Total (mg/L) | | | | |
| | Selenium (Se)-Total (ug/L) | | | | |
| | Silicon (Si)-Total (mg/L) | | | | |
| | Silver (Ag)-Total (mg/L) | | | | |
| | Sodium (Na)-Total (mg/L) | | | | |
| | Strontium (Sr)-Total (mg/L) | | | | |
| | Thallium (Tl)-Total (mg/L) | | | | |
| | Tin (Sn)-Total (mg/L) | | | | |
| | Titanium (Ti)-Total (mg/L) | | | | |
| | Uranium (U)-Total (mg/L) | | | | |
| | Vanadium (V)-Total (mg/L) | | | | |
| | Zinc (Zn)-Total (mg/L) | | | | |
| Dissolved Metals | Dissolved Mercury Filtration Location | | | | |
| | Dissolved Metals Filtration Location | | | | |
| | Aluminum (Al)-Dissolved (mg/L) | | | | |
| | Antimony (Sb)-Dissolved (mg/L) | | | | |
| | Arsenic (As)-Dissolved (mg/L) | | | | |
| | Barium (Ba)-Dissolved (mg/L) | | | | |
| | Beryllium (Be)-Dissolved (ug/L) | | | | |
| | Bismuth (Bi)-Dissolved (mg/L) | | | | |
| | Boron (B)-Dissolved (mg/L) | | | | |
| | Cadmium (Cd)-Dissolved (ug/L) | | | | |
| | Calcium (Ca)-Dissolved (mg/L) | | | | |
| | Chromium (Cr)-Dissolved (mg/L) | | | | |
| | Cobalt (Co)-Dissolved (ug/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID Description Sampled Date Sampled Time Client ID | L2280498-1 WS 27-MAY-19 10:45 RG_GO13_WS_20 190527-1045 | L2280498-2 WS 27-MAY-19 12:40 RG_ERWSF_WS_ 20190527-1240 | L2280498-3 WS 27-MAY-19 14:00 RG_STPD_WS_20 190527-1400 | L2280498-4 WS 27-MAY-19 14:30 RG_FBLANK_WS_ 20190527-1430 | L2280498-5 WS 27-MAY-19 14:30 RG_TRIP_WS_201 90527-1430 |
|---|--|---|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | 0.174 | <0.010 | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0288 | 0.0023 | 0.0057 | <0.0010 |
| | Magnesium (Mg)-Dissolved (mg/L) | 69.7 | 14.3 | 19.0 | <0.10 |
| | Manganese (Mn)-Dissolved (mg/L) | 0.0257 | 0.00146 | <0.00010 | <0.00010 |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.00204 | 0.000512 | 0.000867 | <0.000050 |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00095 | 0.00062 | <0.00050 | <0.00050 |
| | Potassium (K)-Dissolved (mg/L) | 2.04 | 1.36 | 0.470 | <0.050 |
| | Selenium (Se)-Dissolved (ug/L) | 63.1 | 0.548 | 6.17 | <0.050 |
| | Silicon (Si)-Dissolved (mg/L) | 2.56 | 2.47 | 1.03 | <0.050 |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| | Sodium (Na)-Dissolved (mg/L) | 9.83 | 16.7 | 3.44 | <0.050 |
| | Strontium (Sr)-Dissolved (mg/L) | 0.451 | 0.149 | 0.171 | <0.00020 |
| | Thallium (Tl)-Dissolved (mg/L) | 0.000013 | <0.000010 | <0.000010 | <0.000010 |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 |
| | Uranium (U)-Dissolved (mg/L) | 0.00298 | 0.000471 | 0.000829 | <0.000010 |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | <0.0010 | <0.0010 | <0.0010 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample ID | Description | Sampled Date | Sampled Time | Client ID | L2280498-6 | L2280498-7 | L2280498-8 | L2280498-9 | L2280498-10 |
|-------------------------|----------------------------------|--------------|--------------|----------------------------|----------------------------|----------------------------|------------------------------|-----------------------------|--|
| | | | | | WS | WS | WS | WS | WS |
| | | 27-MAY-19 | 12:00 | RG_ER_WS_2019 0527-1200 | 27-MAY-19 14:00 | 27-MAY-19 14:00 | 27-MAY-19 15:30 | 27-MAY-19 15:45 | 27-MAY-19 10:45 |
| | | | | | RG_ER_WS_2019 0527-1200 | RG_GC_WS_2019 0527-1400 | RG_EROL_WS_20 190527-1530 | RG_DUP_WS_201 90527-1545 | RG_GO13_WS_20 190527-1045 FB- HG |
| Grouping | Analyte | | | | | | | | |
| WATER | | | | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 | <0.00050 |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 | <0.000050 |
| | Lithium (Li)-Dissolved (mg/L) | 0.0013 | 0.0011 | 0.0038 | 0.0040 | | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 9.42 | 7.86 | 14.7 | 14.0 | | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00381 | 0.00149 | 0.00318 | 0.00252 | | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | <0.0000050 | <0.0000050 | | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000518 | 0.000365 | 0.000583 | 0.000586 | | | | |
| | Nickel (Ni)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.499 | 0.499 | 0.509 | 0.498 | | | | |
| | Selenium (Se)-Dissolved (ug/L) | 0.418 | 0.566 | 2.25 | 2.49 | | | | |
| | Silicon (Si)-Dissolved (mg/L) | 2.37 | 2.89 | 2.28 | 2.23 | | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | | |
| | Sodium (Na)-Dissolved (mg/L) | 3.09 | 2.04 | 3.03 | 3.14 | | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.128 | 0.0799 | 0.132 | 0.140 | | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | <0.000010 | <0.000010 | | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | <0.00010 | <0.00010 | | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | <0.010 | <0.010 | | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.000668 | 0.000476 | 0.000504 | 0.000561 | | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | <0.00050 | <0.00050 | | | | |
| | Zinc (Zn)-Dissolved (mg/L) | <0.0010 | <0.0010 | 0.0011 | <0.0010 | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | L2280498-11 | L2280498-12 | L2280498-13 | L2280498-14 | L2280498-15 |
|-------------------------|----------------------------------|------------------------------------|-----------------------------------|-------------------------------------|---------------------------------|---------------------------------|
| | Description | WS | WS | WS | WS | WS |
| | Sampled Date | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 | 27-MAY-19 |
| | Sampled Time | 12:40 | 14:00 | 14:30 | 12:00 | 14:00 |
| | Client ID | RG_ERWSF_WS_20190527-1240 FB-HG | RG_STPD_WS_20190527-1400 FB-HG | RG_FBLANK_WS_20190527-1430 FB-HG | RG_ER_WS_20190527-1200 FB-HG | RG_GC_WS_20190527-1400 FB-HG |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | | | | | |
| | Iron (Fe)-Dissolved (mg/L) | | | | | |
| | Lead (Pb)-Dissolved (mg/L) | | | | | |
| | Lithium (Li)-Dissolved (mg/L) | | | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | | | | | |
| | Manganese (Mn)-Dissolved (mg/L) | | | | | |
| | Mercury (Hg)-Dissolved (mg/L) | | | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | | | | | |
| | Nickel (Ni)-Dissolved (mg/L) | | | | | |
| | Potassium (K)-Dissolved (mg/L) | | | | | |
| | Selenium (Se)-Dissolved (ug/L) | | | | | |
| | Silicon (Si)-Dissolved (mg/L) | | | | | |
| | Silver (Ag)-Dissolved (mg/L) | | | | | |
| | Sodium (Na)-Dissolved (mg/L) | | | | | |
| | Strontium (Sr)-Dissolved (mg/L) | | | | | |
| | Thallium (Tl)-Dissolved (mg/L) | | | | | |
| | Tin (Sn)-Dissolved (mg/L) | | | | | |
| | Titanium (Ti)-Dissolved (mg/L) | | | | | |
| | Uranium (U)-Dissolved (mg/L) | | | | | |
| | Vanadium (V)-Dissolved (mg/L) | | | | | |
| | Zinc (Zn)-Dissolved (mg/L) | | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID | Description | Sampled Date | Sampled Time | Client ID |
|-------------------------|--|-------------|--------------|--------------|------------------------------------|
| | L2280498-16 | WS | 27-MAY-19 | 15:30 | RG_EROL_WS_20 190527-1530 FB-HG |
| | L2280498-17 | WS | 27-MAY-19 | 15:45 | RG_DUP_WS_201 90527-1545 FB-HG |
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) Iron (Fe)-Dissolved (mg/L) Lead (Pb)-Dissolved (mg/L) Lithium (Li)-Dissolved (mg/L) Magnesium (Mg)-Dissolved (mg/L) Manganese (Mn)-Dissolved (mg/L) Mercury (Hg)-Dissolved (mg/L) Molybdenum (Mo)-Dissolved (mg/L) Nickel (Ni)-Dissolved (mg/L) Potassium (K)-Dissolved (mg/L) Selenium (Se)-Dissolved (ug/L) Silicon (Si)-Dissolved (mg/L) Silver (Ag)-Dissolved (mg/L) Sodium (Na)-Dissolved (mg/L) Strontium (Sr)-Dissolved (mg/L) Thallium (Tl)-Dissolved (mg/L) Tin (Sn)-Dissolved (mg/L) Titanium (Ti)-Dissolved (mg/L) Uranium (U)-Dissolved (mg/L) Vanadium (V)-Dissolved (mg/L) Zinc (Zn)-Dissolved (mg/L) | | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|--|
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2280498-1, -2, -3, -4, -6, -7, -8 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Boron (B)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2280498-1, -2, -3, -4, -6, -7, -8 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2280498-1, -2, -3, -4, -6, -7, -8 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Manganese (Mn)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Potassium (K)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2280498-1, -2, -3, -4, -6, -7, -8 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2280498-1, -2, -3, -4, -6, -7, -8 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2280498-9 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2280498-1, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2280498-1, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2280498-1, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Sodium (Na)-Total | MS-B | L2280498-1, -2, -3, -4, -5, -6, -7, -8, -9 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2280498-1, -2, -3, -4, -5, -6, -7, -8, -9 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide. | | | |

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by

Reference Information

subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-CL Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Reference Information

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation reduction potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-CL Water pH APHA 4500 H-Electrode

pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-CL Water Total Dissolved Solids APHA 2540 C

A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS).

TECKCOAL-IONBAL-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$$

TKN-L-F-CL Water Total Kjeldahl Nitrogen APHA 4500-NORG (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.

TSS-L-CL Water Total Suspended Solids APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

TURBIDITY-CL Water Turbidity APHA 2130 B-Nephelometer

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REDSIDE SHINER

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0
 Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | Water | | | | | | |
| Batch | R4656522 | | | | | | | |
| WG3066693-3 | DUP | L2280498-6 | | | | | | |
| Acidity (as CaCO3) | | 2.1 | 1.8 | | mg/L | 17 | 20 | 03-JUN-19 |
| WG3066693-2 | LCS | | 105.4 | | % | | 85-115 | 03-JUN-19 |
| Acidity (as CaCO3) | | | 104.2 | | % | | 85-115 | 03-JUN-19 |
| WG3066693-5 | LCS | | 1.2 | | mg/L | | 2 | 03-JUN-19 |
| Acidity (as CaCO3) | | | 1.0 | | mg/L | | 2 | 03-JUN-19 |
| WG3066693-1 | MB | | | | | | | |
| Acidity (as CaCO3) | | | | | | | | |
| WG3066693-4 | MB | | | | | | | |
| Acidity (as CaCO3) | | | | | | | | |
| ALK-MAN-CL | | Water | | | | | | |
| Batch | R4656666 | | | | | | | |
| WG3066728-15 | DUP | L2280498-6 | | | | | | |
| Alkalinity, Total (as CaCO3) | | 104 | 93.1 | | mg/L | 11 | 20 | 03-JUN-19 |
| WG3066728-14 | LCS | | 99.9 | | % | | 85-115 | 03-JUN-19 |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 03-JUN-19 |
| WG3066728-13 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | | | | | | |
| BE-D-L-CCMS-VA | | Water | | | | | | |
| Batch | R4650852 | | | | | | | |
| WG3062345-10 | LCS | | 94.6 | | % | | 80-120 | 30-MAY-19 |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 30-MAY-19 |
| WG3062345-9 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | | | | | | |
| Batch | R4652862 | | | | | | | |
| WG3063543-2 | LCS | | 100.1 | | % | | 80-120 | 31-MAY-19 |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 31-MAY-19 |
| WG3063543-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | | | | | | |
| BE-T-L-CCMS-VA | | Water | | | | | | |
| Batch | R4651391 | | | | | | | |
| WG3062303-2 | LCS | | 102.2 | | % | | 80-120 | 30-MAY-19 |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 30-MAY-19 |
| WG3062303-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | | | | | | |
| BR-L-IC-N-CL | | Water | | | | | | |



Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| BR-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Bromide (Br) | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Bromide (Br) | | | 101.3 | | % | | 85-115 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Bromide (Br) | | | 109.7 | | % | | 75-125 | 29-MAY-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4651987 | | | | | | | |
| WG3063861-3 | DUP | L2280498-2 | | | | | | |
| Dissolved Organic Carbon | | 3.40 | 3.48 | | mg/L | 2.4 | 20 | 30-MAY-19 |
| WG3063861-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 99.2 | | % | | 80-120 | 30-MAY-19 |
| WG3063861-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 30-MAY-19 |
| WG3063861-4 | MS | L2280498-2 | | | | | | |
| Dissolved Organic Carbon | | | 74.7 | | % | | 70-130 | 30-MAY-19 |
| Batch | R4653378 | | | | | | | |
| WG3064893-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 88.0 | | % | | 80-120 | 31-MAY-19 |
| WG3064893-6 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 97.8 | | % | | 80-120 | 31-MAY-19 |
| WG3064893-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 31-MAY-19 |
| WG3064893-5 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 31-MAY-19 |
| C-TOT-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4651987 | | | | | | | |
| WG3063861-3 | DUP | L2280498-2 | | | | | | |
| Total Organic Carbon | | 3.36 | 3.37 | | mg/L | 0.3 | 20 | 30-MAY-19 |
| WG3063861-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 100.5 | | % | | 80-120 | 30-MAY-19 |
| WG3063861-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 30-MAY-19 |
| WG3063861-4 | MS | L2280498-2 | | | | | | |
| Total Organic Carbon | | | 82.9 | | % | | 70-130 | 30-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| C-TOT-ORG-LOW-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4653378 | | | | | | | |
| WG3064893-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 93.6 | | % | | 80-120 | 31-MAY-19 |
| WG3064893-6 | LCS | | | | | | | |
| Total Organic Carbon | | | 104.9 | | % | | 80-120 | 31-MAY-19 |
| WG3064893-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 31-MAY-19 |
| WG3064893-5 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 31-MAY-19 |
| CL-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Chloride (Cl) | | <0.50 | <0.50 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Chloride (Cl) | | | 99.9 | | % | | 90-110 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Chloride (Cl) | | | 105.1 | | % | | 75-125 | 29-MAY-19 |
| EC-L-PCT-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4656666 | | | | | | | |
| WG3066728-15 | DUP | L2280498-6 | | | | | | |
| Conductivity (@ 25C) | | 234 | 232 | | uS/cm | 0.9 | 10 | 03-JUN-19 |
| WG3066728-14 | LCS | | | | | | | |
| Conductivity (@ 25C) | | | 106.7 | | % | | 90-110 | 03-JUN-19 |
| WG3066728-13 | MB | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 03-JUN-19 |
| F-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Fluoride (F) | | <0.020 | <0.020 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Fluoride (F) | | | 104.9 | | % | | 90-110 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Fluoride (F) | | | 109.2 | | % | | 75-125 | 29-MAY-19 |
| HG-D-CVAA-VA | | | | | | | | |
| Water | | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|------------|-----------|-------|-----|----------|-----------|
| HG-D-CVAA-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4651720 | | | | | | | |
| WG3063454-2 | LCS | | | | | | | |
| Mercury (Hg)-Dissolved | | | 101.5 | | % | | 80-120 | 31-MAY-19 |
| WG3063454-1 | MB | | | | | | | |
| Mercury (Hg)-Dissolved | | | <0.000005C | | mg/L | | 0.000005 | 31-MAY-19 |
| HG-T-U-CVAF-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4657434 | | | | | | | |
| WG3067395-5 | DUP | L2280498-8 | | | | | | |
| Mercury (Hg)-Total | | <0.00050 | <0.00050 | RPD-NA | ug/L | N/A | 20 | 04-JUN-19 |
| WG3067395-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 100.6 | | % | | 80-120 | 04-JUN-19 |
| WG3067395-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 04-JUN-19 |
| WG3067395-6 | MS | L2280498-9 | | | | | | |
| Mercury (Hg)-Total | | | 95.7 | | % | | 70-130 | 04-JUN-19 |
| MET-D-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650852 | | | | | | | |
| WG3062345-10 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 100.7 | | % | | 80-120 | 30-MAY-19 |
| Antimony (Sb)-Dissolved | | | 94.9 | | % | | 80-120 | 30-MAY-19 |
| Arsenic (As)-Dissolved | | | 96.7 | | % | | 80-120 | 30-MAY-19 |
| Barium (Ba)-Dissolved | | | 98.2 | | % | | 80-120 | 30-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 100.4 | | % | | 80-120 | 30-MAY-19 |
| Boron (B)-Dissolved | | | 92.9 | | % | | 80-120 | 30-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 95.8 | | % | | 80-120 | 30-MAY-19 |
| Calcium (Ca)-Dissolved | | | 96.1 | | % | | 80-120 | 30-MAY-19 |
| Chromium (Cr)-Dissolved | | | 96.0 | | % | | 80-120 | 30-MAY-19 |
| Cobalt (Co)-Dissolved | | | 96.7 | | % | | 80-120 | 30-MAY-19 |
| Copper (Cu)-Dissolved | | | 94.8 | | % | | 80-120 | 30-MAY-19 |
| Iron (Fe)-Dissolved | | | 94.4 | | % | | 80-120 | 30-MAY-19 |
| Lead (Pb)-Dissolved | | | 98.2 | | % | | 80-120 | 30-MAY-19 |
| Lithium (Li)-Dissolved | | | 93.6 | | % | | 80-120 | 30-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 102.8 | | % | | 80-120 | 30-MAY-19 |
| Manganese (Mn)-Dissolved | | | 95.4 | | % | | 80-120 | 30-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 98.8 | | % | | 80-120 | 30-MAY-19 |
| Nickel (Ni)-Dissolved | | | 94.4 | | % | | 80-120 | 30-MAY-19 |
| Potassium (K)-Dissolved | | | 101.9 | | % | | 80-120 | 30-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4650852 | | | | | | | |
| WG3062345-10 LCS | | | | | | | | |
| Selenium (Se)-Dissolved | | | 96.8 | | % | | 80-120 | 30-MAY-19 |
| Silicon (Si)-Dissolved | | | 100.2 | | % | | 60-140 | 30-MAY-19 |
| Silver (Ag)-Dissolved | | | 100.7 | | % | | 80-120 | 30-MAY-19 |
| Sodium (Na)-Dissolved | | | 103.6 | | % | | 80-120 | 30-MAY-19 |
| Strontium (Sr)-Dissolved | | | 98.6 | | % | | 80-120 | 30-MAY-19 |
| Thallium (Tl)-Dissolved | | | 100.2 | | % | | 80-120 | 30-MAY-19 |
| Tin (Sn)-Dissolved | | | 94.8 | | % | | 80-120 | 30-MAY-19 |
| Titanium (Ti)-Dissolved | | | 95.1 | | % | | 80-120 | 30-MAY-19 |
| Uranium (U)-Dissolved | | | 96.4 | | % | | 80-120 | 30-MAY-19 |
| Vanadium (V)-Dissolved | | | 98.7 | | % | | 80-120 | 30-MAY-19 |
| Zinc (Zn)-Dissolved | | | 94.3 | | % | | 80-120 | 30-MAY-19 |
| WG3062345-9 MB | | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 30-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 30-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 30-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 30-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 30-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 30-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 30-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 30-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4650852 | | | | | | | |
| WG3062345-9 | MB | LF | | | | | | |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 30-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 30-MAY-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 30-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 30-MAY-19 |
| Batch | R4652862 | | | | | | | |
| WG3063543-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 108.6 | | % | | 80-120 | 31-MAY-19 |
| Antimony (Sb)-Dissolved | | | 100.3 | | % | | 80-120 | 31-MAY-19 |
| Arsenic (As)-Dissolved | | | 107.7 | | % | | 80-120 | 31-MAY-19 |
| Barium (Ba)-Dissolved | | | 108.2 | | % | | 80-120 | 31-MAY-19 |
| Bismuth (Bi)-Dissolved | | | 102.7 | | % | | 80-120 | 31-MAY-19 |
| Boron (B)-Dissolved | | | 96.2 | | % | | 80-120 | 31-MAY-19 |
| Cadmium (Cd)-Dissolved | | | 109.0 | | % | | 80-120 | 31-MAY-19 |
| Calcium (Ca)-Dissolved | | | 99.5 | | % | | 80-120 | 31-MAY-19 |
| Chromium (Cr)-Dissolved | | | 102.7 | | % | | 80-120 | 31-MAY-19 |
| Cobalt (Co)-Dissolved | | | 104.8 | | % | | 80-120 | 31-MAY-19 |
| Copper (Cu)-Dissolved | | | 103.9 | | % | | 80-120 | 31-MAY-19 |
| Iron (Fe)-Dissolved | | | 102.7 | | % | | 80-120 | 31-MAY-19 |
| Lead (Pb)-Dissolved | | | 103.6 | | % | | 80-120 | 31-MAY-19 |
| Lithium (Li)-Dissolved | | | 99.1 | | % | | 80-120 | 31-MAY-19 |
| Magnesium (Mg)-Dissolved | | | 105.4 | | % | | 80-120 | 31-MAY-19 |
| Manganese (Mn)-Dissolved | | | 106.3 | | % | | 80-120 | 31-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | 105.2 | | % | | 80-120 | 31-MAY-19 |
| Nickel (Ni)-Dissolved | | | 106.6 | | % | | 80-120 | 31-MAY-19 |
| Potassium (K)-Dissolved | | | 106.7 | | % | | 80-120 | 31-MAY-19 |
| Selenium (Se)-Dissolved | | | 101.8 | | % | | 80-120 | 31-MAY-19 |
| Silicon (Si)-Dissolved | | | 103.7 | | % | | 60-140 | 31-MAY-19 |
| Silver (Ag)-Dissolved | | | 104.7 | | % | | 80-120 | 31-MAY-19 |
| Sodium (Na)-Dissolved | | | 110.5 | | % | | 80-120 | 31-MAY-19 |
| Strontium (Sr)-Dissolved | | | 107.9 | | % | | 80-120 | 31-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4652862 | | | | | | | |
| WG3063543-2 | LCS | | | | | | | |
| Thallium (Tl)-Dissolved | | | 102.3 | | % | | 80-120 | 31-MAY-19 |
| Tin (Sn)-Dissolved | | | 103.5 | | % | | 80-120 | 31-MAY-19 |
| Titanium (Ti)-Dissolved | | | 105.8 | | % | | 80-120 | 31-MAY-19 |
| Uranium (U)-Dissolved | | | 105.5 | | % | | 80-120 | 31-MAY-19 |
| Vanadium (V)-Dissolved | | | 107.6 | | % | | 80-120 | 31-MAY-19 |
| Zinc (Zn)-Dissolved | | | 107.3 | | % | | 80-120 | 31-MAY-19 |
| WG3063543-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 31-MAY-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 31-MAY-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 31-MAY-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 31-MAY-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 31-MAY-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 31-MAY-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 31-MAY-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 31-MAY-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 31-MAY-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 31-MAY-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 31-MAY-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 31-MAY-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 31-MAY-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 31-MAY-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 31-MAY-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 31-MAY-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 31-MAY-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 31-MAY-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 31-MAY-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 31-MAY-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 31-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4652862 | | | | | | | |
| WG3063543-1 | MB | LF | | | | | | |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 31-MAY-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 31-MAY-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 31-MAY-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4651391 | | | | | | | |
| WG3062303-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 109.1 | | % | | 80-120 | 30-MAY-19 |
| Antimony (Sb)-Total | | | 106.9 | | % | | 80-120 | 30-MAY-19 |
| Arsenic (As)-Total | | | 106.5 | | % | | 80-120 | 30-MAY-19 |
| Barium (Ba)-Total | | | 113.9 | | % | | 80-120 | 30-MAY-19 |
| Bismuth (Bi)-Total | | | 110.6 | | % | | 80-120 | 30-MAY-19 |
| Boron (B)-Total | | | 99.3 | | % | | 80-120 | 30-MAY-19 |
| Cadmium (Cd)-Total | | | 106.7 | | % | | 80-120 | 30-MAY-19 |
| Calcium (Ca)-Total | | | 101.2 | | % | | 80-120 | 30-MAY-19 |
| Chromium (Cr)-Total | | | 109.8 | | % | | 80-120 | 30-MAY-19 |
| Cobalt (Co)-Total | | | 106.0 | | % | | 80-120 | 30-MAY-19 |
| Copper (Cu)-Total | | | 103.8 | | % | | 80-120 | 30-MAY-19 |
| Iron (Fe)-Total | | | 98.8 | | % | | 80-120 | 30-MAY-19 |
| Lead (Pb)-Total | | | 103.5 | | % | | 80-120 | 30-MAY-19 |
| Lithium (Li)-Total | | | 102.6 | | % | | 80-120 | 30-MAY-19 |
| Magnesium (Mg)-Total | | | 105.9 | | % | | 80-120 | 30-MAY-19 |
| Manganese (Mn)-Total | | | 108.9 | | % | | 80-120 | 30-MAY-19 |
| Molybdenum (Mo)-Total | | | 106.4 | | % | | 80-120 | 30-MAY-19 |
| Nickel (Ni)-Total | | | 106.9 | | % | | 80-120 | 30-MAY-19 |
| Potassium (K)-Total | | | 107.5 | | % | | 80-120 | 30-MAY-19 |
| Selenium (Se)-Total | | | 112.9 | | % | | 80-120 | 30-MAY-19 |
| Silicon (Si)-Total | | | 109.6 | | % | | 80-120 | 30-MAY-19 |
| Silver (Ag)-Total | | | 110.2 | | % | | 80-120 | 30-MAY-19 |
| Sodium (Na)-Total | | | 99.4 | | % | | 80-120 | 30-MAY-19 |
| Strontium (Sr)-Total | | | 102.0 | | % | | 80-120 | 30-MAY-19 |
| Thallium (Tl)-Total | | | 104.3 | | % | | 80-120 | 30-MAY-19 |
| Tin (Sn)-Total | | | 104.2 | | % | | 80-120 | 30-MAY-19 |
| Titanium (Ti)-Total | | | 105.5 | | % | | 80-120 | 30-MAY-19 |
| Uranium (U)-Total | | | 102.0 | | % | | 80-120 | 30-MAY-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4651391 | | | | | | | |
| WG3062303-2 | LCS | | | | | | | |
| Vanadium (V)-Total | | | 107.8 | | % | | 80-120 | 30-MAY-19 |
| Zinc (Zn)-Total | | | 109.2 | | % | | 80-120 | 30-MAY-19 |
| WG3062303-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 30-MAY-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 30-MAY-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 30-MAY-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 30-MAY-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 30-MAY-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 30-MAY-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 30-MAY-19 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 30-MAY-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 30-MAY-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 30-MAY-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 30-MAY-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 30-MAY-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 30-MAY-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 30-MAY-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 30-MAY-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 30-MAY-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 30-MAY-19 |

NH3-L-F-CL

Water



Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|-----------------|-------------------|----------|-----------|-------|------|---------|-----------|
| NH3-L-F-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4654407 | | | | | | | |
| WG3066145-12 | DUP | L2280498-4 | | | | | | |
| Ammonia as N | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 03-JUN-19 |
| WG3066145-10 | LCS | | | | | | | |
| Ammonia as N | | | 98.7 | | % | | 85-115 | 03-JUN-19 |
| WG3066145-6 | LCS | | | | | | | |
| Ammonia as N | | | 100.7 | | % | | 85-115 | 03-JUN-19 |
| WG3066145-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 03-JUN-19 |
| WG3066145-9 | MB | | | | | | | |
| Ammonia as N | | | 0.0.0004 | | mg/L | | | 03-JUN-19 |
| WG3066145-11 | MS | L2280498-4 | | | | | | |
| Ammonia as N | | | 100.1 | | % | | 75-125 | 03-JUN-19 |
| NO2-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Nitrite (as N) | | <0.0010 | <0.0010 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Nitrite (as N) | | | 102.8 | | % | | 90-110 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Nitrite (as N) | | | 107.7 | | % | | 75-125 | 29-MAY-19 |
| NO3-L-IC-N-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Nitrate (as N) | | <0.0050 | <0.0050 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.0 | | % | | 90-110 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Nitrate (as N) | | | 105.1 | | % | | 75-125 | 29-MAY-19 |
| ORP-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4655009 | | | | | | | |
| WG3066587-5 | CRM | CL-ORP | | | | | | |
| ORP | | | 221 | | mV | | 210-230 | 03-JUN-19 |
| WG3066587-6 | DUP | L2280498-7 | | | | | | |
| ORP | | 406 | 419 | J | mV | 12.4 | 15 | 03-JUN-19 |



Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------------------|----------|------------|---------|-----------|-------|------|---------|-----------|
| P-T-L-COL-CL Water | | | | | | | | |
| Batch | R4654027 | | | | | | | |
| WG3065686-22 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 103.7 | | % | | 80-120 | 31-MAY-19 |
| WG3065686-21 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 31-MAY-19 |
| PH-CL Water | | | | | | | | |
| Batch | R4656666 | | | | | | | |
| WG3066728-15 | DUP | L2280498-6 | | | | | | |
| pH | | 8.05 | 8.05 | J | pH | 0.00 | 0.2 | 03-JUN-19 |
| WG3066728-14 | LCS | | | | | | | |
| pH | | | 6.99 | | pH | | 6.9-7.1 | 03-JUN-19 |
| PO4-DO-L-COL-CL Water | | | | | | | | |
| Batch | R4651439 | | | | | | | |
| WG3062056-18 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 106.3 | | % | | 80-120 | 29-MAY-19 |
| WG3062056-17 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 29-MAY-19 |
| SO4-IC-N-CL Water | | | | | | | | |
| Batch | R4650451 | | | | | | | |
| WG3062671-3 | DUP | L2280498-5 | | | | | | |
| Sulfate (SO4) | | <0.30 | <0.30 | RPD-NA | mg/L | N/A | 20 | 29-MAY-19 |
| WG3062671-2 | LCS | | | | | | | |
| Sulfate (SO4) | | | 100.7 | | % | | 90-110 | 29-MAY-19 |
| WG3062671-1 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 29-MAY-19 |
| WG3062671-4 | MS | L2280498-5 | | | | | | |
| Sulfate (SO4) | | | 109.2 | | % | | 75-125 | 29-MAY-19 |
| SOLIDS-TDS-CL Water | | | | | | | | |
| Batch | R4654421 | | | | | | | |
| WG3064813-14 | LCS | | | | | | | |
| Total Dissolved Solids | | | 96.6 | | % | | 85-115 | 01-JUN-19 |
| WG3064813-13 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 01-JUN-19 |
| TKN-L-F-CL Water | | | | | | | | |
| Batch | R4653955 | | | | | | | |
| WG3065563-12 | DUP | L2280498-9 | | | | | | |
| Total Kjeldahl Nitrogen | | 0.087 | 0.083 | | mg/L | 5.5 | 20 | 02-JUN-19 |
| WG3065563-11 | LCS | | | | | | | |



Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|-----------------|--------------|--------|-----------|-------|-----|--------|-----------|
| TKN-L-F-CL | | Water | | | | | | |
| Batch | R4653955 | | | | | | | |
| WG3065563-11 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.0 | | % | | 75-125 | 02-JUN-19 |
| WG3065563-14 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 90.8 | | % | | 75-125 | 02-JUN-19 |
| WG3065563-2 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 90.9 | | % | | 75-125 | 02-JUN-19 |
| WG3065563-5 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 91.8 | | % | | 75-125 | 02-JUN-19 |
| WG3065563-8 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 90.7 | | % | | 75-125 | 02-JUN-19 |
| WG3065563-1 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 02-JUN-19 |
| WG3065563-10 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 02-JUN-19 |
| WG3065563-13 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 02-JUN-19 |
| WG3065563-4 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 02-JUN-19 |
| WG3065563-7 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 02-JUN-19 |
| TSS-L-CL | | Water | | | | | | |
| Batch | R4653174 | | | | | | | |
| WG3064541-10 | LCS | | | | | | | |
| Total Suspended Solids | | | 97.2 | | % | | 85-115 | 31-MAY-19 |
| WG3064541-9 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 31-MAY-19 |
| TURBIDITY-CL | | Water | | | | | | |
| Batch | R4652366 | | | | | | | |
| WG3063857-2 | LCS | | | | | | | |
| Turbidity | | | 97.0 | | % | | 85-115 | 30-MAY-19 |
| WG3063857-1 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 30-MAY-19 |

Quality Control Report

Workorder: L2280498

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|---|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2280498

Report Date: 05-JUN-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|--|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation redution potential by elect. | | | | | | | |
| | 1 | 27-MAY-19 10:45 | 03-JUN-19 14:30 | 0.25 | 172 | hours | EHTR-FM |
| | 2 | 27-MAY-19 12:40 | 03-JUN-19 14:30 | 0.25 | 170 | hours | EHTR-FM |
| | 3 | 27-MAY-19 14:00 | 03-JUN-19 14:30 | 0.25 | 168 | hours | EHTR-FM |
| | 4 | 27-MAY-19 14:30 | 03-JUN-19 14:30 | 0.25 | 168 | hours | EHTR-FM |
| | 5 | 27-MAY-19 14:30 | 03-JUN-19 14:30 | 0.25 | 168 | hours | EHTR-FM |
| | 6 | 27-MAY-19 12:00 | 03-JUN-19 14:30 | 0.25 | 170 | hours | EHTR-FM |
| | 7 | 27-MAY-19 14:00 | 03-JUN-19 14:30 | 0.25 | 168 | hours | EHTR-FM |
| | 8 | 27-MAY-19 15:30 | 03-JUN-19 14:30 | 0.25 | 167 | hours | EHTR-FM |
| | 9 | 27-MAY-19 15:45 | 03-JUN-19 14:30 | 0.25 | 167 | hours | EHTR-FM |
| pH | | | | | | | |
| | 1 | 27-MAY-19 10:45 | 03-JUN-19 09:00 | 0.25 | 166 | hours | EHTR-FM |
| | 2 | 27-MAY-19 12:40 | 03-JUN-19 09:00 | 0.25 | 164 | hours | EHTR-FM |
| | 3 | 27-MAY-19 14:00 | 03-JUN-19 09:00 | 0.25 | 163 | hours | EHTR-FM |
| | 4 | 27-MAY-19 14:30 | 03-JUN-19 09:00 | 0.25 | 162 | hours | EHTR-FM |
| | 5 | 27-MAY-19 14:30 | 03-JUN-19 09:00 | 0.25 | 162 | hours | EHTR-FM |
| | 6 | 27-MAY-19 12:00 | 03-JUN-19 09:00 | 0.25 | 165 | hours | EHTR-FM |
| | 7 | 27-MAY-19 14:00 | 03-JUN-19 09:00 | 0.25 | 163 | hours | EHTR-FM |
| | 8 | 27-MAY-19 15:30 | 03-JUN-19 09:00 | 0.25 | 162 | hours | EHTR-FM |
| | 9 | 27-MAY-19 15:45 | 03-JUN-19 09:00 | 0.25 | 161 | hours | EHTR-FM |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2280498 were received on 28-MAY-19 09:15.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Teck

RESIDE SHOWER TOXICITY STUDY
-Leach Area Supporting Study

TURNAROUND TIME:

COC ID:

PROJECT/CLIENT INFO

LABORATORY

Facility Name / Job Regional Effects Program (REP)

Lab Name ALS Calgary

Lab Contact Lyudmyla Shvets

Project Manager Cait Good

Email lyudmyla.shvets@alsglobal.com

Email cait.good@teck.com

Address 2559 29 Street NE

Address 421 Pine Avenue

Province BC

City Calgary

Province AB

City Sparwood

V0B 2G0

Country Canada

Postal Code T1Y 7B5

Country Canada

Postal Code

Phone Number 1 403 407 1794

Phone Number 250-425-8202

SAMPLE DETAILS

ANALYSIS REQUESTED

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. |
|---------------------------|-----------------|--------------|-----------------------------|-------------|-------------|------------------|------------|
| RG-GOIA-WS-20A0523-1045 | | | No | 2019-MAY-27 | 10:45 | G | 1 |
| RG-ERWSF-WS-20A0523-1240 | | | No | 2019-MAY-27 | 12:40 | G | 1 |
| RG-STPD-WS-20A0523-1400 | | | No | 2019-MAY-27 | 14:00 | G | 1 |
| RG-FBLANK-WS-20A0523-1400 | | | No | 2019-MAY-27 | 14:30 | G | 1 |
| RG-TRIP-WS-20A0523-1430 | | | No | 2019-MAY-27 | 14:30 | G | 1 |
| RG-ER-WS-20A0523-1700 | | | No | 2019-MAY-27 | 17:00 | G | 1 |
| RG-GC-WS-20A0523-1400 | | | No | 2019-MAY-27 | 14:00 | G | 1 |
| RG-EROL-WS-20A0523-1530 | | | No | 2019-MAY-27 | 15:30 | G | 1 |
| RG-DUP-WS-20A0523-1545 | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |
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| | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |
| | | | No | | | | |

| ANALYSIS REQUESTED | TS | N | N | N | N | N | N | N |
|-----------------------|----|---|---|---|---|---|---|---|
| TECKCOAL-ROUTINE-VA | | | | | | | | |
| ALS_Package-BOC | | | | | | | | |
| ALS_Predigest-TKN/TOC | | | | | | | | |
| HG-T-II-CYAF-VA | | | | | | | | |
| HG-D-CYAF-VA | | | | | | | | |
| TECKCOAL-MET-T-VA | | | | | | | | |
| TECKCOAL-MET-D-VA | | | | | | | | |
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ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION DATE/TIME ACCEPTED BY/AFFILIATION

5/28 9:15

12°C

NB OF BOTTLES RETURNED/DESCRIPTION
 Regular (default) x
 Priority (2-3 business days) - 50% surcharge
 Emergency (1 Business Day) - 100% surcharge
 For Emergency <1 Day, ASAP or Weekend - Contact ALS!

Sampler's Name Maddu Stoval
 Sampler's Signature [Signature]
 Mobile #
 Date/Time 2019-MAY-27 11:30

3370

3370



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 04-JUN-19
Report Date: 11-JUN-19 16:37 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2284959
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-LENTIC 19-12
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | Sample ID Description Sampled Date Sampled Time Client ID | L2284959-1 WS 03-JUN-19 09:30 RG_STPD_WS_20 190603-0930 | L2284959-2 WS 03-JUN-19 12:00 RG_ER_WS_2019 0603-1200 | | |
|-----------------------------------|---|--|--|--|--|
| Grouping | Analyte | | | | |
| WATER | | | | | |
| Physical Tests | Conductivity (@ 25C) (uS/cm) | 409 | 189 | | |
| | Hardness (as CaCO3) (mg/L) | 205 | 86.5 | | |
| | pH (pH) | 8.29 | 8.08 | | |
| | ORP (mV) | 469 | 362 | | |
| | Total Suspended Solids (mg/L) | <1.0 | 15.4 | | |
| | Total Dissolved Solids (mg/L) | 223 ^{DLHC} | 102 ^{DLHC} | | |
| | Turbidity (NTU) | 0.90 | 15.0 | | |
| Anions and Nutrients | Acidity (as CaCO3) (mg/L) | 1.2 | 1.1 | | |
| | Alkalinity, Bicarbonate (as CaCO3) (mg/L) | 159 | 80.2 | | |
| | Alkalinity, Carbonate (as CaCO3) (mg/L) | 3.2 | <1.0 | | |
| | Alkalinity, Hydroxide (as CaCO3) (mg/L) | <1.0 | <1.0 | | |
| | Alkalinity, Total (as CaCO3) (mg/L) | 162 | 80.2 | | |
| | Ammonia as N (mg/L) | 0.0192 | 0.0245 | | |
| | Bromide (Br) (mg/L) | <0.050 | <0.050 | | |
| | Chloride (Cl) (mg/L) | 2.45 | 1.32 | | |
| | Fluoride (F) (mg/L) | 0.171 | 0.055 | | |
| | Ion Balance (%) | 97.2 | 94.6 | | |
| | Nitrate (as N) (mg/L) | 0.640 | 0.146 | | |
| | Nitrite (as N) (mg/L) | 0.0055 | <0.0010 | | |
| | Total Kjeldahl Nitrogen (mg/L) | 0.375 | 0.207 | | |
| | Orthophosphate-Dissolved (as P) (mg/L) | <0.0010 | <0.0010 | | |
| | Phosphorus (P)-Total (mg/L) | 0.0026 | 0.0056 | | |
| | Sulfate (SO4) (mg/L) | 48.2 | 13.1 | | |
| | Anion Sum (meq/L) | 4.37 | 1.93 | | |
| | Cation Sum (meq/L) | 4.25 | 1.82 | | |
| | Cation - Anion Balance (%) | -1.4 | -2.8 | | |
| Organic / Inorganic Carbon | Dissolved Organic Carbon (mg/L) | 1.28 | 1.11 | | |
| | Total Organic Carbon (mg/L) | 1.37 | 1.53 | | |
| Total Metals | Aluminum (Al)-Total (mg/L) | 0.0053 | 0.350 | | |
| | Antimony (Sb)-Total (mg/L) | 0.00010 | <0.00010 | | |
| | Arsenic (As)-Total (mg/L) | 0.00019 | 0.00045 | | |
| | Barium (Ba)-Total (mg/L) | 0.0929 | 0.0255 | | |
| | Beryllium (Be)-Total (ug/L) | <0.020 | <0.020 | | |
| | Bismuth (Bi)-Total (mg/L) | <0.000050 | <0.000050 | | |
| | Boron (B)-Total (mg/L) | <0.010 | <0.010 | | |
| | Cadmium (Cd)-Total (ug/L) | 0.0149 | 0.0068 | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2284959-1 | L2284959-2 |
|-------------------------|---------------------------------------|--------------|------------------------------|----------------------------|
| | | Description | WS | WS |
| | | Sampled Date | 03-JUN-19 | 03-JUN-19 |
| | | Sampled Time | 09:30 | 12:00 |
| | | Client ID | RG_STPD_WS_20 190603-0930 | RG_ER_WS_2019 0603-1200 |
| Grouping | Analyte | | | |
| WATER | | | | |
| Total Metals | Calcium (Ca)-Total (mg/L) | | 56.8 | 27.7 |
| | Chromium (Cr)-Total (mg/L) | | 0.00030 | 0.00054 |
| | Cobalt (Co)-Total (ug/L) | | <0.10 | 0.23 |
| | Copper (Cu)-Total (mg/L) | | <0.00050 | 0.00068 |
| | Iron (Fe)-Total (mg/L) | | 0.021 | 0.352 |
| | Lead (Pb)-Total (mg/L) | | <0.000050 | 0.000435 |
| | Lithium (Li)-Total (mg/L) | | 0.0062 | 0.0011 |
| | Magnesium (Mg)-Total (mg/L) | | 15.2 | 6.73 |
| | Manganese (Mn)-Total (mg/L) | | 0.00676 | 0.0147 |
| | Mercury (Hg)-Total (ug/L) | | <0.00050 | 0.00103 |
| | Molybdenum (Mo)-Total (mg/L) | | 0.000984 | 0.000461 |
| | Nickel (Ni)-Total (mg/L) | | <0.00050 | 0.00055 |
| | Potassium (K)-Total (mg/L) | | 0.534 | 0.472 |
| | Selenium (Se)-Total (ug/L) | | 5.67 | 0.092 |
| | Silicon (Si)-Total (mg/L) | | 1.87 | 2.60 |
| | Silver (Ag)-Total (mg/L) | | <0.000010 | <0.000010 |
| | Sodium (Na)-Total (mg/L) | | 2.91 | 1.80 |
| | Strontium (Sr)-Total (mg/L) | | 0.166 | 0.107 |
| | Thallium (Tl)-Total (mg/L) | | <0.000010 | <0.000010 |
| | Tin (Sn)-Total (mg/L) | | <0.00010 | <0.00010 |
| | Titanium (Ti)-Total (mg/L) | | <0.010 | <0.010 |
| | Uranium (U)-Total (mg/L) | | 0.000854 | 0.000582 |
| | Vanadium (V)-Total (mg/L) | | <0.00050 | 0.00071 |
| | Zinc (Zn)-Total (mg/L) | | <0.0030 | <0.0030 |
| Dissolved Metals | Dissolved Mercury Filtration Location | | LAB | LAB |
| | Dissolved Metals Filtration Location | | LAB | LAB |
| | Aluminum (Al)-Dissolved (mg/L) | | <0.0030 | 0.0147 |
| | Antimony (Sb)-Dissolved (mg/L) | | <0.00010 | <0.00010 |
| | Arsenic (As)-Dissolved (mg/L) | | 0.00014 | 0.00031 |
| | Barium (Ba)-Dissolved (mg/L) | | 0.0879 | 0.0218 |
| | Beryllium (Be)-Dissolved (ug/L) | | <0.020 | <0.020 |
| | Bismuth (Bi)-Dissolved (mg/L) | | <0.000050 | <0.000050 |
| | Boron (B)-Dissolved (mg/L) | | <0.010 | <0.010 |
| | Cadmium (Cd)-Dissolved (ug/L) | | 0.0104 | 0.0053 |
| | Calcium (Ca)-Dissolved (mg/L) | | 56.1 | 25.2 |
| | Chromium (Cr)-Dissolved (mg/L) | | 0.00012 | <0.00010 |
| | Cobalt (Co)-Dissolved (ug/L) | | <0.10 | <0.10 |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| | | Sample ID | L2284959-1 | L2284959-2 | | |
|-------------------------|----------------------------------|--------------|------------------------------|----------------------------|--|--|
| | | Description | WS | WS | | |
| | | Sampled Date | 03-JUN-19 | 03-JUN-19 | | |
| | | Sampled Time | 09:30 | 12:00 | | |
| | | Client ID | RG_STPD_WS_20 190603-0930 | RG_ER_WS_2019 0603-1200 | | |
| Grouping | Analyte | | | | | |
| WATER | | | | | | |
| Dissolved Metals | Copper (Cu)-Dissolved (mg/L) | <0.00050 | <0.00050 | | | |
| | Iron (Fe)-Dissolved (mg/L) | <0.010 | <0.010 | | | |
| | Lead (Pb)-Dissolved (mg/L) | <0.000050 | <0.000050 | | | |
| | Lithium (Li)-Dissolved (mg/L) | 0.0058 | <0.0010 | | | |
| | Magnesium (Mg)-Dissolved (mg/L) | 15.8 | 5.70 | | | |
| | Manganese (Mn)-Dissolved (mg/L) | 0.00016 | 0.00451 | | | |
| | Mercury (Hg)-Dissolved (mg/L) | <0.0000050 | <0.0000050 | | | |
| | Molybdenum (Mo)-Dissolved (mg/L) | 0.000983 | 0.000506 | | | |
| | Nickel (Ni)-Dissolved (mg/L) | 0.00057 | <0.00050 | | | |
| | Potassium (K)-Dissolved (mg/L) | 0.516 | 0.434 | | | |
| | Selenium (Se)-Dissolved (ug/L) | 5.64 | 0.116 | | | |
| | Silicon (Si)-Dissolved (mg/L) | 1.81 | 2.01 | | | |
| | Silver (Ag)-Dissolved (mg/L) | <0.000010 | <0.000010 | | | |
| | Sodium (Na)-Dissolved (mg/L) | 2.95 | 1.81 | | | |
| | Strontium (Sr)-Dissolved (mg/L) | 0.167 | 0.104 | | | |
| | Thallium (Tl)-Dissolved (mg/L) | <0.000010 | <0.000010 | | | |
| | Tin (Sn)-Dissolved (mg/L) | <0.00010 | <0.00010 | | | |
| | Titanium (Ti)-Dissolved (mg/L) | <0.010 | <0.010 | | | |
| | Uranium (U)-Dissolved (mg/L) | 0.000800 | 0.000549 | | | |
| | Vanadium (V)-Dissolved (mg/L) | <0.00050 | <0.00050 | | | |
| | Zinc (Zn)-Dissolved (mg/L) | 0.0017 | 0.0224 ^{DTC} | | | |

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|--|
| SFPL | Sample was Filtered and Preserved at the laboratory - DOC/D-METAL/D-HG FILTERED AND PRESERVED AT THE LAB |

QC Samples with Qualifiers & Comments:

| QC Type Description | Parameter | Qualifier | Applies to Sample Number(s) |
|---------------------|--------------------------|-----------|-----------------------------|
| Method Blank | Aluminum (Al)-Dissolved | B | L2284959-1, -2 |
| Method Blank | Chromium (Cr)-Dissolved | MB-LOR | L2284959-2 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2284959-1 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2284959-1, -2 |
| Matrix Spike | Barium (Ba)-Dissolved | MS-B | L2284959-2 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2284959-1 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2284959-1, -2 |
| Matrix Spike | Calcium (Ca)-Dissolved | MS-B | L2284959-2 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2284959-1 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2284959-1, -2 |
| Matrix Spike | Magnesium (Mg)-Dissolved | MS-B | L2284959-2 |
| Matrix Spike | Selenium (Se)-Dissolved | MS-B | L2284959-1 |
| Matrix Spike | Sodium (Na)-Dissolved | MS-B | L2284959-1, -2 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2284959-1 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2284959-1, -2 |
| Matrix Spike | Strontium (Sr)-Dissolved | MS-B | L2284959-2 |
| Matrix Spike | Barium (Ba)-Total | MS-B | L2284959-1, -2 |
| Matrix Spike | Calcium (Ca)-Total | MS-B | L2284959-1, -2 |
| Matrix Spike | Magnesium (Mg)-Total | MS-B | L2284959-1, -2 |
| Matrix Spike | Strontium (Sr)-Total | MS-B | L2284959-1, -2 |

Qualifiers for Individual Parameters Listed:

| Qualifier | Description |
|-----------|--|
| B | Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable. |
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |
| DTC | Dissolved concentration exceeds total. Results were confirmed by re-analysis. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|--|--------------------------|
| ACIDITY-PCT-CL | Water | Acidity by Automatic Titration | APHA 2310 Acidity |
| This analysis is carried out using procedures adapted from APHA Method 2310 "Acidity". Acidity is determined by potentiometric titration to a specified endpoint. | | | |
| ALK-MAN-CL | Water | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BE-D-L-CCMS-VA | Water | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS. | | | |
| BE-T-L-CCMS-VA | Water | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| BR-L-IC-N-CL | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-LOW-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |

Reference Information

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL Water Total Organic Carbon APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.

TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

CL-IC-N-CL Water Chloride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-L-PCT-CL Water Electrical Conductivity (EC) APHA 2510B

Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25C.

F-IC-N-CL Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-U-CVAF-VA Water Total Mercury in Water by CVAFS (Ultra) EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-BC-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-L-F-CL Water Ammonia, Total (as N) J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et

Reference Information

al.

NO2-L-IC-N-CL Water Nitrite in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-CL Water Nitrate in Water by IC (Low Level) EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

ORP-CL Water Oxidation redution potential by elect. ASTM D1498

This analysis is carried out in accordance with the procedure described in the "ASTM" method D1498 "Oxidation-Reduction Potential of Water" published by the American Society for Testing and Materials (ASTM). Results are reported as observed oxidation-reduction potential of the platinum metal-reference electrode employed, in mV.

It is recommended that this analysis be conducted in the field.

P-T-L-COL-CL Water Phosphorus (P)-Total APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH-CL Water pH APHA 4500 H-Electrode

pH is determined in the laboratory using a pH electrode. All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed)

PO4-DO-L-COL-CL Water Orthophosphate-Dissolved (as P) APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

SO4-IC-N-CL Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-CL Water Total Dissolved Solids APHA 2540 C

A well-mixed sample is filtered through a glass fibre filter paper. The filtrate is then evaporated to dryness in a pre-weighed vial and dried at 180 – 2 °C. The increase in vial weight represents the total dissolved solids (TDS).

TECKCOAL-IONBAL-CL Water Ion Balance Calculation APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

$$\text{Ion Balance (\%)} = \frac{[\text{Cation Sum} - \text{Anion Sum}]}{[\text{Cation Sum} + \text{Anion Sum}]}$$

TKN-L-F-CL Water Total Kjeldahl Nitrogen APHA 4500-NORG (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.

TSS-L-CL Water Total Suspended Solids APHA 2540 D-Gravimetric

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total suspended solids (TSS) are determined by filtering a sample through a glass fibre filter, and by drying the filter at 104 deg. C.

TURBIDITY-CL Water Turbidity APHA 2130 B-Nephelometer

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |

Chain of Custody Numbers:

REP-LENTIC 19-12

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg wwt - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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Client: Teck Coal Ltd.
 421 Pine Avenue
 Sparwood BC V0B 2G0

Contact: Cait Good

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| ACIDITY-PCT-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4663639 | | | | | | | |
| WG3073547-5 | LCS | | | | | | | |
| Acidity (as CaCO3) | | | 101.2 | | % | | 85-115 | 10-JUN-19 |
| WG3073547-4 | MB | | | | | | | |
| Acidity (as CaCO3) | | | <1.0 | | mg/L | | 2 | 10-JUN-19 |
| ALK-MAN-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4663608 | | | | | | | |
| WG3073486-11 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 100.8 | | % | | 85-115 | 10-JUN-19 |
| WG3073486-10 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | <1.0 | | mg/L | | 1 | 10-JUN-19 |
| BE-D-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4660281 | | | | | | | |
| WG3069572-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 99.6 | | % | | 80-120 | 06-JUN-19 |
| WG3069572-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 06-JUN-19 |
| Batch | R4661141 | | | | | | | |
| WG3070334-2 | LCS | | | | | | | |
| Beryllium (Be)-Dissolved | | | 92.5 | | % | | 80-120 | 07-JUN-19 |
| WG3070334-1 | MB | LF | | | | | | |
| Beryllium (Be)-Dissolved | | | <0.000020 | | mg/L | | 0.00002 | 07-JUN-19 |
| BE-T-L-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3069458-2 | LCS | | | | | | | |
| Beryllium (Be)-Total | | | 99.1 | | % | | 80-120 | 07-JUN-19 |
| WG3069458-1 | MB | | | | | | | |
| Beryllium (Be)-Total | | | <0.000020 | | mg/L | | 0.00002 | 07-JUN-19 |
| BR-L-IC-N-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 | LCS | | | | | | | |
| Bromide (Br) | | | 102.6 | | % | | 85-115 | 05-JUN-19 |
| WG3069383-5 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 05-JUN-19 |
| C-DIS-ORG-LOW-CL | | | | | | | | |
| | Water | | | | | | | |



Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|--------------|-------------------|------------|-----------|-------|-----|--------|-----------|
| C-DIS-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4660317 | | | | | | | |
| WG3069773-10 LCS | | | | | | | | |
| Dissolved Organic Carbon | | | 110.6 | | % | | 80-120 | 10-JUN-19 |
| WG3069773-9 MB | | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 06-JUN-19 |
| C-TOT-ORG-LOW-CL | Water | | | | | | | |
| Batch | R4660317 | | | | | | | |
| WG3069773-10 LCS | | | | | | | | |
| Total Organic Carbon | | | 87.4 | | % | | 80-120 | 05-JUN-19 |
| WG3069773-9 MB | | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 05-JUN-19 |
| CL-IC-N-CL | Water | | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 LCS | | | | | | | | |
| Chloride (Cl) | | | 101.0 | | % | | 90-110 | 05-JUN-19 |
| WG3069383-5 MB | | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 05-JUN-19 |
| EC-L-PCT-CL | Water | | | | | | | |
| Batch | R4663608 | | | | | | | |
| WG3073486-11 LCS | | | | | | | | |
| Conductivity (@ 25C) | | | 104.8 | | % | | 90-110 | 10-JUN-19 |
| WG3073486-10 MB | | | | | | | | |
| Conductivity (@ 25C) | | | <2.0 | | uS/cm | | 2 | 10-JUN-19 |
| F-IC-N-CL | Water | | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 LCS | | | | | | | | |
| Fluoride (F) | | | 104.3 | | % | | 90-110 | 05-JUN-19 |
| WG3069383-5 MB | | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 05-JUN-19 |
| HG-D-CVAA-VA | Water | | | | | | | |
| Batch | R4663103 | | | | | | | |
| WG3072650-3 DUP | | L2284959-2 | | | | | | |
| Mercury (Hg)-Dissolved | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 10-JUN-19 |
| WG3072650-2 LCS | | | | | | | | |
| Mercury (Hg)-Dissolved | | | 99.3 | | % | | 80-120 | 10-JUN-19 |
| WG3072650-4 MS | | L2284959-1 | | | | | | |
| Mercury (Hg)-Dissolved | | | 102.1 | | % | | 70-130 | 10-JUN-19 |
| HG-T-U-CVAF-VA | Water | | | | | | | |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|----------|-----------|-------|-----|--------|-----------|
| HG-T-U-CVAF-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661583 | | | | | | | |
| WG3071293-5 | DUP | L2284959-1 | | | | | | |
| Mercury (Hg)-Total | | <0.00050 | <0.00050 | RPD-NA | ug/L | N/A | 20 | 07-JUN-19 |
| WG3071293-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 106.6 | | % | | 80-120 | 07-JUN-19 |
| WG3071293-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.00050 | | ug/L | | 0.0005 | 07-JUN-19 |
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4660281 | | | | | | | |
| WG3069572-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 96.0 | | % | | 80-120 | 06-JUN-19 |
| Antimony (Sb)-Dissolved | | | 95.5 | | % | | 80-120 | 06-JUN-19 |
| Arsenic (As)-Dissolved | | | 96.0 | | % | | 80-120 | 06-JUN-19 |
| Barium (Ba)-Dissolved | | | 98.0 | | % | | 80-120 | 06-JUN-19 |
| Bismuth (Bi)-Dissolved | | | 93.8 | | % | | 80-120 | 06-JUN-19 |
| Cadmium (Cd)-Dissolved | | | 100.8 | | % | | 80-120 | 06-JUN-19 |
| Calcium (Ca)-Dissolved | | | 98.9 | | % | | 80-120 | 06-JUN-19 |
| Cobalt (Co)-Dissolved | | | 96.1 | | % | | 80-120 | 06-JUN-19 |
| Copper (Cu)-Dissolved | | | 95.8 | | % | | 80-120 | 06-JUN-19 |
| Iron (Fe)-Dissolved | | | 92.5 | | % | | 80-120 | 06-JUN-19 |
| Lead (Pb)-Dissolved | | | 97.9 | | % | | 80-120 | 06-JUN-19 |
| Lithium (Li)-Dissolved | | | 96.9 | | % | | 80-120 | 06-JUN-19 |
| Magnesium (Mg)-Dissolved | | | 96.0 | | % | | 80-120 | 06-JUN-19 |
| Manganese (Mn)-Dissolved | | | 97.0 | | % | | 80-120 | 06-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | 98.2 | | % | | 80-120 | 06-JUN-19 |
| Nickel (Ni)-Dissolved | | | 95.9 | | % | | 80-120 | 06-JUN-19 |
| Potassium (K)-Dissolved | | | 93.9 | | % | | 80-120 | 06-JUN-19 |
| Selenium (Se)-Dissolved | | | 101.5 | | % | | 80-120 | 06-JUN-19 |
| Silicon (Si)-Dissolved | | | 101.2 | | % | | 60-140 | 06-JUN-19 |
| Silver (Ag)-Dissolved | | | 95.4 | | % | | 80-120 | 06-JUN-19 |
| Sodium (Na)-Dissolved | | | 103.1 | | % | | 80-120 | 06-JUN-19 |
| Strontium (Sr)-Dissolved | | | 98.5 | | % | | 80-120 | 06-JUN-19 |
| Thallium (Tl)-Dissolved | | | 94.5 | | % | | 80-120 | 06-JUN-19 |
| Tin (Sn)-Dissolved | | | 98.4 | | % | | 80-120 | 06-JUN-19 |
| Titanium (Ti)-Dissolved | | | 92.4 | | % | | 80-120 | 06-JUN-19 |
| Uranium (U)-Dissolved | | | 96.2 | | % | | 80-120 | 06-JUN-19 |
| Vanadium (V)-Dissolved | | | 96.9 | | % | | 80-120 | 06-JUN-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4660281 | | | | | | | |
| WG3069572-2 | LCS | | | | | | | |
| Zinc (Zn)-Dissolved | | | 96.5 | | % | | 80-120 | 06-JUN-19 |
| WG3069572-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 06-JUN-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 06-JUN-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 06-JUN-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 06-JUN-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 06-JUN-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 06-JUN-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 06-JUN-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 06-JUN-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 06-JUN-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 06-JUN-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 06-JUN-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 06-JUN-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 06-JUN-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 06-JUN-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 06-JUN-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 06-JUN-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 06-JUN-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 06-JUN-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 06-JUN-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 06-JUN-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 06-JUN-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 06-JUN-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 06-JUN-19 |
| Batch | R4661141 | | | | | | | |
| WG3070334-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 100.7 | | % | | 80-120 | 07-JUN-19 |
| Antimony (Sb)-Dissolved | | | 98.8 | | % | | 80-120 | 07-JUN-19 |
| Arsenic (As)-Dissolved | | | 98.2 | | % | | 80-120 | 07-JUN-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3070334-2 | LCS | | | | | | | |
| Barium (Ba)-Dissolved | | | 96.3 | | % | | 80-120 | 07-JUN-19 |
| Bismuth (Bi)-Dissolved | | | 96.8 | | % | | 80-120 | 07-JUN-19 |
| Boron (B)-Dissolved | | | 93.1 | | % | | 80-120 | 07-JUN-19 |
| Cadmium (Cd)-Dissolved | | | 99.4 | | % | | 80-120 | 07-JUN-19 |
| Calcium (Ca)-Dissolved | | | 96.5 | | % | | 80-120 | 07-JUN-19 |
| Chromium (Cr)-Dissolved | | | 94.7 | | % | | 80-120 | 07-JUN-19 |
| Cobalt (Co)-Dissolved | | | 100.0 | | % | | 80-120 | 07-JUN-19 |
| Copper (Cu)-Dissolved | | | 98.1 | | % | | 80-120 | 07-JUN-19 |
| Iron (Fe)-Dissolved | | | 98.1 | | % | | 80-120 | 07-JUN-19 |
| Lead (Pb)-Dissolved | | | 97.2 | | % | | 80-120 | 07-JUN-19 |
| Lithium (Li)-Dissolved | | | 94.9 | | % | | 80-120 | 07-JUN-19 |
| Magnesium (Mg)-Dissolved | | | 93.6 | | % | | 80-120 | 07-JUN-19 |
| Manganese (Mn)-Dissolved | | | 100.7 | | % | | 80-120 | 07-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | 102.3 | | % | | 80-120 | 07-JUN-19 |
| Nickel (Ni)-Dissolved | | | 98.2 | | % | | 80-120 | 07-JUN-19 |
| Potassium (K)-Dissolved | | | 98.1 | | % | | 80-120 | 07-JUN-19 |
| Selenium (Se)-Dissolved | | | 99.0 | | % | | 80-120 | 07-JUN-19 |
| Silicon (Si)-Dissolved | | | 107.2 | | % | | 60-140 | 07-JUN-19 |
| Silver (Ag)-Dissolved | | | 97.7 | | % | | 80-120 | 07-JUN-19 |
| Sodium (Na)-Dissolved | | | 101.3 | | % | | 80-120 | 07-JUN-19 |
| Strontium (Sr)-Dissolved | | | 99.8 | | % | | 80-120 | 07-JUN-19 |
| Thallium (Tl)-Dissolved | | | 97.1 | | % | | 80-120 | 07-JUN-19 |
| Tin (Sn)-Dissolved | | | 99.2 | | % | | 80-120 | 07-JUN-19 |
| Titanium (Ti)-Dissolved | | | 105.0 | | % | | 80-120 | 07-JUN-19 |
| Uranium (U)-Dissolved | | | 93.0 | | % | | 80-120 | 07-JUN-19 |
| Vanadium (V)-Dissolved | | | 100.7 | | % | | 80-120 | 07-JUN-19 |
| Zinc (Zn)-Dissolved | | | 102.5 | | % | | 80-120 | 07-JUN-19 |
| WG3070334-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | 0.0010 | B | mg/L | | 0.001 | 07-JUN-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 07-JUN-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3070334-1 | MB | LF | | | | | | |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 07-JUN-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Chromium (Cr)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 07-JUN-19 |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 07-JUN-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 07-JUN-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 07-JUN-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 07-JUN-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 07-JUN-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 07-JUN-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 07-JUN-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 07-JUN-19 |
| Batch | R4662888 | | | | | | | |
| WG3071513-2 | LCS | | | | | | | |
| Aluminum (Al)-Dissolved | | | 101.2 | | % | | 80-120 | 08-JUN-19 |
| Antimony (Sb)-Dissolved | | | 99.0 | | % | | 80-120 | 08-JUN-19 |
| Arsenic (As)-Dissolved | | | 98.8 | | % | | 80-120 | 08-JUN-19 |
| Barium (Ba)-Dissolved | | | 101.5 | | % | | 80-120 | 08-JUN-19 |
| Bismuth (Bi)-Dissolved | | | 99.8 | | % | | 80-120 | 08-JUN-19 |
| Boron (B)-Dissolved | | | 96.1 | | % | | 80-120 | 08-JUN-19 |
| Cadmium (Cd)-Dissolved | | | 100.5 | | % | | 80-120 | 08-JUN-19 |
| Calcium (Ca)-Dissolved | | | 99.7 | | % | | 80-120 | 08-JUN-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4662888 | | | | | | | |
| WG3071513-2 | LCS | | | | | | | |
| Chromium (Cr)-Dissolved | | | 99.3 | | % | | 80-120 | 08-JUN-19 |
| Cobalt (Co)-Dissolved | | | 99.0 | | % | | 80-120 | 08-JUN-19 |
| Copper (Cu)-Dissolved | | | 96.5 | | % | | 80-120 | 08-JUN-19 |
| Iron (Fe)-Dissolved | | | 96.4 | | % | | 80-120 | 08-JUN-19 |
| Lead (Pb)-Dissolved | | | 97.8 | | % | | 80-120 | 08-JUN-19 |
| Lithium (Li)-Dissolved | | | 96.8 | | % | | 80-120 | 08-JUN-19 |
| Magnesium (Mg)-Dissolved | | | 95.2 | | % | | 80-120 | 08-JUN-19 |
| Manganese (Mn)-Dissolved | | | 97.3 | | % | | 80-120 | 08-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | 97.5 | | % | | 80-120 | 08-JUN-19 |
| Nickel (Ni)-Dissolved | | | 97.8 | | % | | 80-120 | 08-JUN-19 |
| Potassium (K)-Dissolved | | | 101.8 | | % | | 80-120 | 08-JUN-19 |
| Selenium (Se)-Dissolved | | | 99.6 | | % | | 80-120 | 08-JUN-19 |
| Silicon (Si)-Dissolved | | | 102.8 | | % | | 60-140 | 08-JUN-19 |
| Silver (Ag)-Dissolved | | | 97.6 | | % | | 80-120 | 08-JUN-19 |
| Sodium (Na)-Dissolved | | | 99.2 | | % | | 80-120 | 08-JUN-19 |
| Strontium (Sr)-Dissolved | | | 97.7 | | % | | 80-120 | 08-JUN-19 |
| Thallium (Tl)-Dissolved | | | 98.2 | | % | | 80-120 | 08-JUN-19 |
| Tin (Sn)-Dissolved | | | 97.2 | | % | | 80-120 | 08-JUN-19 |
| Titanium (Ti)-Dissolved | | | 98.0 | | % | | 80-120 | 08-JUN-19 |
| Uranium (U)-Dissolved | | | 102.2 | | % | | 80-120 | 08-JUN-19 |
| Vanadium (V)-Dissolved | | | 100.1 | | % | | 80-120 | 08-JUN-19 |
| Zinc (Zn)-Dissolved | | | 97.3 | | % | | 80-120 | 08-JUN-19 |
| WG3071513-1 | MB | LF | | | | | | |
| Aluminum (Al)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 08-JUN-19 |
| Antimony (Sb)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Arsenic (As)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Barium (Ba)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Bismuth (Bi)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 08-JUN-19 |
| Boron (B)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 08-JUN-19 |
| Cadmium (Cd)-Dissolved | | | <0.0000050 | | mg/L | | 0.000005 | 08-JUN-19 |
| Calcium (Ca)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 08-JUN-19 |
| Chromium (Cr)-Dissolved | | | 0.00020 | MB-LOR | mg/L | | 0.0001 | 08-JUN-19 |
| Cobalt (Co)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Copper (Cu)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 08-JUN-19 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-----------|-----------|-----------|-------|-----|---------|-----------|
| MET-D-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4662888 | | | | | | | |
| WG3071513-1 | MB | LF | | | | | | |
| Iron (Fe)-Dissolved | | | <0.010 | | mg/L | | 0.01 | 08-JUN-19 |
| Lead (Pb)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 08-JUN-19 |
| Lithium (Li)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 08-JUN-19 |
| Magnesium (Mg)-Dissolved | | | <0.0050 | | mg/L | | 0.005 | 08-JUN-19 |
| Manganese (Mn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Molybdenum (Mo)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 08-JUN-19 |
| Nickel (Ni)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 08-JUN-19 |
| Potassium (K)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 08-JUN-19 |
| Selenium (Se)-Dissolved | | | <0.000050 | | mg/L | | 0.00005 | 08-JUN-19 |
| Silicon (Si)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 08-JUN-19 |
| Silver (Ag)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 08-JUN-19 |
| Sodium (Na)-Dissolved | | | <0.050 | | mg/L | | 0.05 | 08-JUN-19 |
| Strontium (Sr)-Dissolved | | | <0.00020 | | mg/L | | 0.0002 | 08-JUN-19 |
| Thallium (Tl)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 08-JUN-19 |
| Tin (Sn)-Dissolved | | | <0.00010 | | mg/L | | 0.0001 | 08-JUN-19 |
| Titanium (Ti)-Dissolved | | | <0.00030 | | mg/L | | 0.0003 | 08-JUN-19 |
| Uranium (U)-Dissolved | | | <0.000010 | | mg/L | | 0.00001 | 08-JUN-19 |
| Vanadium (V)-Dissolved | | | <0.00050 | | mg/L | | 0.0005 | 08-JUN-19 |
| Zinc (Zn)-Dissolved | | | <0.0010 | | mg/L | | 0.001 | 08-JUN-19 |
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3069458-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 105.6 | | % | | 80-120 | 07-JUN-19 |
| Antimony (Sb)-Total | | | 105.1 | | % | | 80-120 | 07-JUN-19 |
| Arsenic (As)-Total | | | 102.5 | | % | | 80-120 | 07-JUN-19 |
| Barium (Ba)-Total | | | 99.0 | | % | | 80-120 | 07-JUN-19 |
| Bismuth (Bi)-Total | | | 98.4 | | % | | 80-120 | 07-JUN-19 |
| Boron (B)-Total | | | 94.1 | | % | | 80-120 | 07-JUN-19 |
| Cadmium (Cd)-Total | | | 98.0 | | % | | 80-120 | 07-JUN-19 |
| Calcium (Ca)-Total | | | 99.8 | | % | | 80-120 | 07-JUN-19 |
| Chromium (Cr)-Total | | | 99.6 | | % | | 80-120 | 07-JUN-19 |
| Cobalt (Co)-Total | | | 101.0 | | % | | 80-120 | 07-JUN-19 |
| Copper (Cu)-Total | | | 101.8 | | % | | 80-120 | 07-JUN-19 |
| Iron (Fe)-Total | | | 98.0 | | % | | 80-120 | 07-JUN-19 |



Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3069458-2 | LCS | | | | | | | |
| Lead (Pb)-Total | | | 99.4 | | % | | 80-120 | 07-JUN-19 |
| Lithium (Li)-Total | | | 100.2 | | % | | 80-120 | 07-JUN-19 |
| Magnesium (Mg)-Total | | | 99.2 | | % | | 80-120 | 07-JUN-19 |
| Manganese (Mn)-Total | | | 103.3 | | % | | 80-120 | 07-JUN-19 |
| Molybdenum (Mo)-Total | | | 104.0 | | % | | 80-120 | 07-JUN-19 |
| Nickel (Ni)-Total | | | 101.0 | | % | | 80-120 | 07-JUN-19 |
| Potassium (K)-Total | | | 102.8 | | % | | 80-120 | 07-JUN-19 |
| Selenium (Se)-Total | | | 102.4 | | % | | 80-120 | 07-JUN-19 |
| Silicon (Si)-Total | | | 110.8 | | % | | 80-120 | 07-JUN-19 |
| Silver (Ag)-Total | | | 102.4 | | % | | 80-120 | 07-JUN-19 |
| Sodium (Na)-Total | | | 105.6 | | % | | 80-120 | 07-JUN-19 |
| Strontium (Sr)-Total | | | 102.2 | | % | | 80-120 | 07-JUN-19 |
| Thallium (Tl)-Total | | | 98.4 | | % | | 80-120 | 07-JUN-19 |
| Tin (Sn)-Total | | | 100.3 | | % | | 80-120 | 07-JUN-19 |
| Titanium (Ti)-Total | | | 101.3 | | % | | 80-120 | 07-JUN-19 |
| Uranium (U)-Total | | | 98.2 | | % | | 80-120 | 07-JUN-19 |
| Vanadium (V)-Total | | | 102.8 | | % | | 80-120 | 07-JUN-19 |
| Zinc (Zn)-Total | | | 101.9 | | % | | 80-120 | 07-JUN-19 |
| WG3069458-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 07-JUN-19 |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 07-JUN-19 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 07-JUN-19 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 07-JUN-19 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 07-JUN-19 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 07-JUN-19 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 07-JUN-19 |



Quality Control Report

Workorder: L2284959

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|--------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | Water | | | | | | |
| Batch | R4661141 | | | | | | | |
| WG3069458-1 | MB | | | | | | | |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 07-JUN-19 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 07-JUN-19 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 07-JUN-19 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 07-JUN-19 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 07-JUN-19 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 07-JUN-19 |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 07-JUN-19 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 07-JUN-19 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 07-JUN-19 |
| NH3-L-F-CL | | Water | | | | | | |
| Batch | R4663746 | | | | | | | |
| WG3073877-6 | LCS | | | | | | | |
| Ammonia as N | | | 100.4 | | % | | 85-115 | 10-JUN-19 |
| WG3073877-5 | MB | | | | | | | |
| Ammonia as N | | | <0.0050 | | mg/L | | 0.005 | 10-JUN-19 |
| NO2-L-IC-N-CL | | Water | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 | LCS | | | | | | | |
| Nitrite (as N) | | | 102.7 | | % | | 90-110 | 05-JUN-19 |
| WG3069383-5 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 05-JUN-19 |
| NO3-L-IC-N-CL | | Water | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 | LCS | | | | | | | |
| Nitrate (as N) | | | 101.4 | | % | | 90-110 | 05-JUN-19 |
| WG3069383-5 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 05-JUN-19 |
| ORP-CL | Water | | | | | | | |



Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------------|--------------|-----------|---------|-----------|-------|-----|---------|-----------|
| ORP-CL | Water | | | | | | | |
| Batch | R4663272 | | | | | | | |
| WG3073457-5 | CRM | CL-ORP | | | | | | |
| ORP | | | 221 | | mV | | 210-230 | 10-JUN-19 |
| P-T-L-COL-CL | Water | | | | | | | |
| Batch | R4661866 | | | | | | | |
| WG3071733-10 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 104.3 | | % | | 80-120 | 08-JUN-19 |
| WG3071733-9 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 08-JUN-19 |
| PH-CL | Water | | | | | | | |
| Batch | R4663608 | | | | | | | |
| WG3073486-11 | LCS | | | | | | | |
| pH | | | 7.00 | | pH | | 6.9-7.1 | 10-JUN-19 |
| PO4-DO-L-COL-CL | Water | | | | | | | |
| Batch | R4660176 | | | | | | | |
| WG3068707-16 | LCS | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | 101.0 | | % | | 80-120 | 05-JUN-19 |
| WG3068707-4 | MB | | | | | | | |
| Orthophosphate-Dissolved (as P) | | | <0.0010 | | mg/L | | 0.001 | 05-JUN-19 |
| SO4-IC-N-CL | Water | | | | | | | |
| Batch | R4659986 | | | | | | | |
| WG3069383-6 | LCS | | | | | | | |
| Sulfate (SO4) | | | 101.9 | | % | | 90-110 | 05-JUN-19 |
| WG3069383-5 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 05-JUN-19 |
| SOLIDS-TDS-CL | Water | | | | | | | |
| Batch | R4661605 | | | | | | | |
| WG3069450-14 | LCS | | | | | | | |
| Total Dissolved Solids | | | 94.7 | | % | | 85-115 | 06-JUN-19 |
| WG3069450-13 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 06-JUN-19 |
| TKN-L-F-CL | Water | | | | | | | |
| Batch | R4662410 | | | | | | | |
| WG3072380-10 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.4 | | % | | 75-125 | 07-JUN-19 |
| WG3072380-2 | LCS | | | | | | | |



Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|-----------------|-----------|--------|-----------|-------|-----|--------|-----------|
| TKN-L-F-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4662410 | | | | | | | |
| WG3072380-2 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.5 | | % | | 75-125 | 07-JUN-19 |
| WG3072380-6 | LCS | | | | | | | |
| Total Kjeldahl Nitrogen | | | 92.6 | | % | | 75-125 | 07-JUN-19 |
| WG3072380-1 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| WG3072380-5 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| WG3072380-9 | MB | | | | | | | |
| Total Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 07-JUN-19 |
| TSS-L-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4661216 | | | | | | | |
| WG3069523-14 | LCS | | | | | | | |
| Total Suspended Solids | | | 109.2 | | % | | 85-115 | 06-JUN-19 |
| WG3069523-13 | MB | | | | | | | |
| Total Suspended Solids | | | <1.0 | | mg/L | | 1 | 06-JUN-19 |
| TURBIDITY-CL | | | | | | | | |
| Water | | | | | | | | |
| Batch | R4660813 | | | | | | | |
| WG3070154-2 | LCS | | | | | | | |
| Turbidity | | | 97.5 | | % | | 85-115 | 06-JUN-19 |
| WG3070154-1 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 06-JUN-19 |

Quality Control Report

Workorder: L2284959

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| B | Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2284959

Report Date: 11-JUN-19

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|---|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Oxidation reduction potential by elect. | | | | | | | |
| | 1 | 03-JUN-19 09:30 | 10-JUN-19 08:20 | 0.25 | 167 | hours | EHTR-FM |
| | 2 | 03-JUN-19 12:00 | 10-JUN-19 08:20 | 0.25 | 164 | hours | EHTR-FM |
| pH | | | | | | | |
| | 1 | 03-JUN-19 09:30 | 10-JUN-19 16:00 | 0.25 | 174 | hours | EHTR-FM |
| | 2 | 03-JUN-19 12:00 | 10-JUN-19 16:00 | 0.25 | 172 | hours | EHTR-FM |

Legend & Qualifier Definitions:

| | |
|----------|---|
| EHTR-FM: | Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended. |
| EHTR: | Exceeded ALS recommended hold time prior to sample receipt. |
| EHTL: | Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry. |
| EHT: | Exceeded ALS recommended hold time prior to analysis. |
| Rec. HT: | ALS recommended hold time (see units). |

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2284959 were received on 04-JUN-19 09:35.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Teck

| | | | | | | | | | |
|----------------------|--------------------------------|----------|--------|--|------------------|-------------------------------|----------|--------|--|
| COC ID: | REP-Lentic 19-12 | | | | TURNAROUND TIME: | | | | |
| PROJECT/CLIENT INFO | | | | | LABORATORY | | | | |
| Facility Name / Job# | Regional Effects Program (REP) | | | | Lab Name | ALS Calgary | | | |
| Project Manager | Cait Good | | | | Lab Contact | Lyudmyla Shvets | | | |
| Email | cait.good@teck.com | | | | Email | lyudmyla.shvets@alsglobal.com | | | |
| Address | 421 Pine Avenue | | | | Address | 2559 29 Street NE | | | |
| City | Sparwood | Province | BC | | City | Calgary | Province | AB | |
| Postal Code | V0B 2G0 | Country | Canada | | Postal Code | T1Y 7B5 | Country | Canada | |
| Phone Number | 250-425-8202 | | | | Phone Number | 1 403 407 1794 | | | |
| | | | | | VPO 616180 | | | | |



L2284959-COFC

| SAMPLE DETAILS | | | | | | | | ANALYSIS REQUESTED | | | | | | | | | |
|--------------------------|-----------------|--------------|-----------------------------|------------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|-------|-----|-----|
| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | Excel | PDF | EDD |
| RG_STPD_WS_20190603-0930 | RG_STPD | WS | No | 03-June-19 | 0930 | G | 7 | X | X | X | X | X | X | X | X | X | X |
| RG_ER_WS_20190603-1200 | RG_ER | WS | No | 09-June-19 | 1200 | G | 7 | X | X | X | X | X | X | X | X | X | X |

| | | | | | | | | | |
|---|--|--|--|-----------------------------|--|-----------|--|-------------------------|--|
| ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS | | | | RELINQUISHED BY/AFFILIATION | | DATE/TIME | | ACCEPTED BY/AFFILIATION | |
| For Sample RG_DUP_WS_20190507-1300 there are 2 bottles labelled as dissolved metals. One of these bottles was acidified. Could the bottles be tested to see which one was acidified and could a total metals sample be collected from the general sample? | | | | | | | | 6/4 9:35 | |
| | | | | | | | | | |
| NB OF BOTTLES RETURNED/DESCRIPTION | | | | Sampler's Name | | Mobile # | | | |
| Regular (default) x Priority (2-3 business days) - 50% surcharge Emergency (1 Business Day) - 100% surcharge For Emergency <1 Day, ASAP or Weekend - Contact ALS | | | | Sampler's Signature | | Date/Time | | | |

9c



Teck Coal Ltd.
ATTN: Cait Good
421 Pine Avenue
Sparwood BC V0B 2G0

Date Received: 20-JUN-19
Report Date: 03-JUL-19 16:40 (MT)
Version: FINAL

Client Phone: 250-425-8202

Certificate of Analysis

Lab Work Order #: L2295901
Project P.O. #: VPO00616180
Job Reference: REGIONAL EFFECTS PROGRAM
C of C Numbers: REP-Lentic 19-10
Legal Site Desc:

Lyudmyla Shvets, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 2559 29 Street NE, Calgary, AB T1Y 7B5 Canada | Phone: +1 403 291 9897 | Fax: +1 403 291 0298
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|------------------------|---|----------|-----------|--------|-------|-----------|-----------|-----|
| L2295901-9 | RG_ER_WS_20190619-1100 | | | | | | | | |
| | | Sample Date: CLIENT on 19-JUN-19 @ 11:00 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Routine for Teck Coal | | | | | | | |
| | | Phosphorus (P)-Total | | | | | | | |
| | | Phosphorus (P)-Total | 0.0061 | | 0.002 | mg/L | | 24-JUN-19 | NK1 |
| | | Ion Balance | 107 | | -100 | % | | 28-JUN-19 | |
| | | ORP | 413 | | -1000 | mV | | 25-JUN-19 | RMS |
| | | pH | 8.09 | | 0.1 | pH | | 27-JUN-19 | RMS |
| | | Turbidity | | | | | | | |
| | | Turbidity | 5.32 | | 0.1 | NTU | | 21-JUN-19 | RGB |
| | | Total Suspended Solids | | | | | | | |
| | | Total Suspended Solids | 5.2 | | 1 | mg/L | | 25-JUN-19 | EDT |
| | | Total Dissolved Solids | | | | | | | |
| | | Total Dissolved Solids | 114 | DLHC | 13 | mg/L | | 24-JUN-19 | LT2 |
| | | Sulfate in Water by IC | | | | | | | |
| | | Sulfate (SO4) | 16.5 | | 0.3 | mg/L | | 20-JUN-19 | SND |
| | | Orthophosphate-Dissolved (as P) | | | | | | | |
| | | Orthophosphate-Dissolved (as P) | <0.0010 | | 0.001 | mg/L | | 20-JUN-19 | RZF |
| | | Nitrite in Water by IC (Low Level) | | | | | | | |
| | | Nitrite (as N) | 0.0014 | | 0.001 | mg/L | | 20-JUN-19 | SND |
| | | Nitrate in Water by IC (Low Level) | | | | | | | |
| | | Nitrate (as N) | 0.122 | | 0.005 | mg/L | | 20-JUN-19 | SND |
| | | Ion Balance Calculation | | | | | | | |
| | | Cation - Anion Balance | 3.3 | | | % | | 28-JUN-19 | |
| | | Anion Sum | 2.12 | | | meq/L | | 28-JUN-19 | |
| | | Cation Sum | 2.27 | | | meq/L | | 28-JUN-19 | |
| | | Fluoride in Water by IC | | | | | | | |
| | | Fluoride (F) | 0.058 | | 0.02 | mg/L | | 20-JUN-19 | SND |
| | | Electrical Conductivity (EC) | | | | | | | |
| | | Conductivity (@ 25C) | 204 | | 2 | uS/cm | | 27-JUN-19 | RMS |
| | | Chloride in Water by IC | | | | | | | |
| | | Chloride (Cl) | 1.35 | | 0.5 | mg/L | | 20-JUN-19 | SND |
| | | Bromide in Water by IC (Low Level) | | | | | | | |
| | | Bromide (Br) | <0.050 | | 0.05 | mg/L | | 20-JUN-19 | SND |
| | | Ammonia, Total (as N) | | | | | | | |
| | | Ammonia as N | <0.0050 | | 0.005 | mg/L | | 25-JUN-19 | LWY |
| | | Alkalinity (Species) by Manual Titration | | | | | | | |
| | | Alkalinity, Bicarbonate (as CaCO3) | 86.6 | | 1 | mg/L | | 27-JUN-19 | RMS |
| | | Alkalinity, Carbonate (as CaCO3) | <1.0 | | 1 | mg/L | | 27-JUN-19 | RMS |
| | | Alkalinity, Hydroxide (as CaCO3) | <1.0 | | 1 | mg/L | | 27-JUN-19 | RMS |
| | | Alkalinity, Total (as CaCO3) | 86.6 | | 1 | mg/L | | 27-JUN-19 | RMS |
| | | Acidity by Automatic Titration | | | | | | | |
| | | Acidity (as CaCO3) | <1.0 | | 1 | mg/L | | 27-JUN-19 | RMS |
| | | Dissolved Metals in Water | | | | | | | |
| | | Hardness | | | | | | | |
| | | Hardness (as CaCO3) | 108 | | 0.5 | mg/L | | 26-JUN-19 | |
| | | Dissolved Metals in Water by CRC ICPMS | | | | | | | |
| | | Dissolved Metals Filtration Location | LAB | | | | | 24-JUN-19 | EM2 |
| | | Aluminum (Al)-Dissolved | 0.0107 | | 0.003 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Antimony (Sb)-Dissolved | <0.00010 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Arsenic (As)-Dissolved | 0.00032 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|------------------------|---|------------|-----------|----------|-------|-----------|-----------|-----|
| L2295901-9 | RG_ER_WS_20190619-1100 | | | | | | | | |
| | | Sample Date: CLIENT on 19-JUN-19 @ 11:00 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Dissolved Metals in Water | | | | | | | |
| | | Dissolved Metals in Water by CRC ICPMS | | | | | | | |
| | | Barium (Ba)-Dissolved | 0.0306 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Bismuth (Bi)-Dissolved | <0.000050 | | 0.00005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Boron (B)-Dissolved | <0.010 | | 0.01 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Cadmium (Cd)-Dissolved | <0.0000050 | | 0.000005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Calcium (Ca)-Dissolved | 29.6 | | 0.05 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Chromium (Cr)-Dissolved | <0.00010 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Cobalt (Co)-Dissolved | <0.00010 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Copper (Cu)-Dissolved | <0.00050 | | 0.0005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Iron (Fe)-Dissolved | <0.010 | | 0.01 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Lead (Pb)-Dissolved | <0.000050 | | 0.00005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Lithium (Li)-Dissolved | 0.0011 | | 0.001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Magnesium (Mg)-Dissolved | 8.36 | | 0.1 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Manganese (Mn)-Dissolved | 0.00012 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Molybdenum (Mo)-Dissolved | 0.000528 | | 0.00005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Nickel (Ni)-Dissolved | <0.00050 | | 0.0005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Potassium (K)-Dissolved | 0.437 | | 0.05 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Selenium (Se)-Dissolved | 0.000349 | | 0.00005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Silicon (Si)-Dissolved | 1.96 | | 0.05 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Silver (Ag)-Dissolved | <0.000010 | | 0.00001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Sodium (Na)-Dissolved | 2.21 | | 0.05 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Strontium (Sr)-Dissolved | 0.114 | | 0.0002 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Thallium (Tl)-Dissolved | <0.000010 | | 0.00001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Tin (Sn)-Dissolved | <0.00010 | | 0.0001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Titanium (Ti)-Dissolved | <0.010 | | 0.01 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Uranium (U)-Dissolved | 0.000580 | | 0.00001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Vanadium (V)-Dissolved | <0.00050 | | 0.0005 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Zinc (Zn)-Dissolved | <0.0010 | | 0.001 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Diss. Mercury in Water by CVAAS or CVAFS | | | | | | | |
| | | Dissolved Mercury Filtration Location | LAB | | | | | 26-JUN-19 | SD3 |
| | | Mercury (Hg)-Dissolved | <0.0000050 | | 0.000005 | mg/L | 26-JUN-19 | 27-JUN-19 | OC1 |
| | | Diss. Be (low) in Water by CRC ICPMS | | | | | | | |
| | | Beryllium (Be)-Dissolved | <0.000020 | | 0.00002 | mg/L | 24-JUN-19 | 25-JUN-19 | KBD |
| | | Dissolved Metals Filtration Location | LAB | | | | | 24-JUN-19 | EM2 |
| | | Mercury (Hg)-Total | 0.00075 | | 0.0005 | ug/L | | 26-JUN-19 | MA2 |
| | | Dissolved Organic Carbon | 1.22 | | 0.5 | mg/L | | 25-JUN-19 | EL5 |
| | | Total Kjeldahl Nitrogen | <0.25 | TKNI | 0.25 | mg/L | | 29-JUN-19 | APH |
| | | Total Organic Carbon | 1.09 | | 0.5 | mg/L | | 25-JUN-19 | EL5 |
| | | Total Metals in Water | | | | | | | |
| | | Total Metals in Water by CRC ICPMS | | | | | | | |
| | | Aluminum (Al)-Total | 0.0698 | | 0.003 | mg/L | | 25-JUN-19 | KBD |
| | | Antimony (Sb)-Total | <0.00010 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Arsenic (As)-Total | 0.00038 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Barium (Ba)-Total | 0.0318 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Bismuth (Bi)-Total | <0.000050 | | 0.00005 | mg/L | | 25-JUN-19 | KBD |
| | | Boron (B)-Total | <0.010 | | 0.01 | mg/L | | 25-JUN-19 | KBD |
| | | Cadmium (Cd)-Total | 0.0000071 | | 0.000005 | mg/L | | 25-JUN-19 | KBD |

ALS LABORATORY GROUP CHEMICAL ANALYSIS REPORT

| Lab ID | Sample ID | Test Description | Result | Qualifier | D.L. | Units | Extracted | Analyzed | By |
|------------|------------------------|---|-----------|-----------|---------|-------|-----------|-----------|-----|
| L2295901-9 | RG_ER_WS_20190619-1100 | | | | | | | | |
| | | Sample Date: CLIENT on 19-JUN-19 @ 11:00 | | | | | | | |
| | | Matrix: WS | | | | | | | |
| | | Total Metals in Water | | | | | | | |
| | | Total Metals in Water by CRC ICPMS | | | | | | | |
| | | Calcium (Ca)-Total | 29.8 | | 0.05 | mg/L | | 25-JUN-19 | KBD |
| | | Chromium (Cr)-Total | 0.00019 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Cobalt (Co)-Total | <0.00010 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Copper (Cu)-Total | <0.00050 | | 0.0005 | mg/L | | 25-JUN-19 | KBD |
| | | Iron (Fe)-Total | 0.075 | | 0.01 | mg/L | | 25-JUN-19 | KBD |
| | | Lead (Pb)-Total | 0.000280 | | 0.00005 | mg/L | | 25-JUN-19 | KBD |
| | | Lithium (Li)-Total | 0.0013 | | 0.001 | mg/L | | 25-JUN-19 | KBD |
| | | Magnesium (Mg)-Total | 7.93 | | 0.1 | mg/L | | 25-JUN-19 | KBD |
| | | Manganese (Mn)-Total | 0.00671 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Molybdenum (Mo)-Total | 0.000535 | | 0.00005 | mg/L | | 25-JUN-19 | KBD |
| | | Nickel (Ni)-Total | <0.00050 | | 0.0005 | mg/L | | 25-JUN-19 | KBD |
| | | Potassium (K)-Total | 0.468 | | 0.05 | mg/L | | 25-JUN-19 | KBD |
| | | Selenium (Se)-Total | 0.000403 | | 0.00005 | mg/L | | 25-JUN-19 | KBD |
| | | Silicon (Si)-Total | 2.19 | | 0.1 | mg/L | | 25-JUN-19 | KBD |
| | | Silver (Ag)-Total | <0.000010 | | 0.00001 | mg/L | | 25-JUN-19 | KBD |
| | | Sodium (Na)-Total | 2.17 | | 0.05 | mg/L | | 25-JUN-19 | KBD |
| | | Strontium (Sr)-Total | 0.110 | | 0.0002 | mg/L | | 25-JUN-19 | KBD |
| | | Thallium (Tl)-Total | <0.000010 | | 0.00001 | mg/L | | 25-JUN-19 | KBD |
| | | Tin (Sn)-Total | <0.00010 | | 0.0001 | mg/L | | 25-JUN-19 | KBD |
| | | Titanium (Ti)-Total | <0.010 | | 0.01 | mg/L | | 25-JUN-19 | KBD |
| | | Uranium (U)-Total | 0.000622 | | 0.00001 | mg/L | | 25-JUN-19 | KBD |
| | | Vanadium (V)-Total | <0.00050 | | 0.0005 | mg/L | | 25-JUN-19 | KBD |
| | | Zinc (Zn)-Total | 0.0048 | | 0.003 | mg/L | | 25-JUN-19 | KBD |
| | | Total Be (Low) in Water by CRC ICPMS | | | | | | | |
| | | Beryllium (Be)-Total | <0.000020 | | 0.00002 | mg/L | | 25-JUN-19 | KBD |

Methodology Reference

| ALS Test Code | Test Description | Methodology Reference (In-House Standard Operating Procedures which Generally Follow:) |
|--------------------|--|--|
| ACIDITY-PCT-CL | Acidity by Automatic Titration | APHA 2310 Acidity |
| NO2-L-IC-N-CL | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| NO3-L-IC-N-CL | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| F-IC-N-CL | Fluoride in Water by IC | EPA 300.1 (mod) |
| HARDNESS-CALC-VA | Hardness | APHA 2340B |
| HG-D-CVAA-VA | Diss. Mercury in Water by CVAAS or CVAFS | APHA 3030B/EPA 1631E (mod) |
| PH-CL | pH | APHA 4500 H-Electrode |
| PO4-DO-L-COL-CL | Orthophosphate-Dissolved (as P) | APHA 4500-P PHOSPHORUS |
| SO4-IC-N-CL | Sulfate in Water by IC | EPA 300.1 (mod) |
| CL-IC-N-CL | Chloride in Water by IC | EPA 300.1 (mod) |
| TSS-L-CL | Total Suspended Solids | APHA 2540 D-Gravimetric |
| MET-D-CCMS-CL | Dissolved Metals in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| BE-D-L-CCMS-VA | Diss. Be (low) in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| BR-L-IC-N-CL | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| EC-L-PCT-CL | Electrical Conductivity (EC) | APHA 2510B |
| ALK-MAN-CL | Alkalinity (Species) by Manual Titration | APHA 2320 ALKALINITY |
| BE-T-L-CCMS-VA | Total Be (Low) in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| MET-D-CCMS-VA | Dissolved Metals in Water by CRC ICPMS | APHA 3030B/6020A (mod) |
| MET-T-CCMS-VA | Total Metals in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| SOLIDS-TDS-CL | Total Dissolved Solids | APHA 2540 C |
| TKN-L-F-CL | Total Kjeldahl Nitrogen | APHA 4500-NORG (TKN) |
| ORP-CL | Oxidation reduction potential by elect. | ASTM D1498 |
| P-T-L-COL-CL | Phosphorus (P)-Total | APHA 4500-P PHOSPHORUS |
| TECKCOAL-IONBAL-CL | Ion Balance Calculation | APHA 1030E |
| C-DIS-ORG-LOW-CL | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| TURBIDITY-CL | Turbidity | APHA 2130 B-Nephelometer |
| C-TOT-ORG-LOW-CL | Total Organic Carbon | APHA 5310 TOTAL ORGANIC CARBON (TOC) |
| HG-T-U-CVAF-VA | Total Mercury in Water by CVAFS (Ultra) | EPA 1631 REV. E |
| IONBALANCE-BC-CL | Ion Balance Calculation | APHA 1030E |
| NH3-L-F-CL | Ammonia, Total (as N) | J. ENVIRON. MONIT., 2005, 7, 37-42, RSC |

Sample Parameter Qualifier key listed:

| Qualifier | Description |
|-----------|---|
| RRV | Reported Result Verified By Repeat Analysis |
| DTC | Dissolved concentration exceeds total. Results were confirmed by re-analysis. |
| TKNI | TKN result may be biased low due to Nitrate interference. Nitrate-N is > 10x TKN. |
| DLHC | Detection Limit Raised: Dilution required due to high concentration of test analyte(s). |

| | | | | | | | | | | | |
|----------------------------|--------------------------------|----------|--------|--|-------------------|-------------------------------|----------|--------|---------------------------|-----|-----|
| COC ID: | REP-Lentic 19-10 | | | | TURNAROUND TIME: | | | | | | |
| PROJECT/CLIENT INFO | | | | | LABORATORY | | | | | | |
| Facility Name / Job# | Regional Effects Program (REP) | | | | Lab Name | ALS Calgary | | | Excel | PDF | EDD |
| Project Manager | Cait Good | | | | Lab Contact | Lyudmyla Shvets | | | | | |
| Email | cait.good@teck.com | | | | Email | lyudmyla.shvets@alsglobal.com | | | cait.good@teck.com | X | X |
| Address | 421 Pine Avenue | | | | Address | 2559 29 Street NE | | | teckcoal@regiononline.com | X | X |
| City | Sparwood | Province | BC | | City | Calgary | Province | AB | teckcoal@regiononline.com | X | X |
| Postal Code | V0B 2G0 | Country | Canada | | Postal Code | T1Y 7B5 | Country | Canada | teckcoal@regiononline.com | X | X |
| Phone Number | 250-425-8202 | | | | Phone Number | 1 403 407 1794 | | | teckcoal@regiononline.com | X | X |

SAMPLE DETAILS

ANALYSIS REQUESTED

Filtered - P Field, L Lab, PLS Field & Lab, N Name

| Sample ID | Sample Location | Field Matrix | Hazardous Material (Yes/No) | Date | Time (24hr) | G=Grab C=Comp | # Of Cont. | ANALYSIS REQUESTED | | | | | | | |
|----------------------------|-----------------|--------------|-----------------------------|-----------|-------------|------------------|------------|---------------------|-----------------|---------------------|----------------|--------------|-------------------|-------------------|--|
| | | | | | | | | TECKCOAL-ROUTINE-VA | ALS_Package-DOC | ALS_Package-TKN/TOC | HG-T-U-CVAF-VA | HG-D-CVAF-VA | TECKCOAL-MET-T-VA | TECKCOAL-MET-D-VA | |
| RG_FBLANK_WS_20190618-1211 | RG_FBLANK | WS | No | 18-Jun-19 | 1211 | G | 7 | X | X | X | X | X | X | | |
| RG_TRIP_WS_20190618-1211 | RG_TRIP | WS | No | 18-Jun-19 | 1211 | G | 4 | X | | X | X | X | | | |
| RG_M116_WS_20190618-1211 | RG_M116 | WS | No | 18-Jun-19 | 1211 | G | 7 | X | X | X | X | X | X | | |
| RG_OTTO_WS_20190618-1015 | RG_OTTO | WS | No | 18-Jun-19 | 1015 | G | 7 | X | X | X | X | X | X | | |
| RG_SEROX_WS_20190618-1355 | RG_SEROX | WS | No | 18-Jun-19 | 1355 | G | 7 | X | X | X | X | X | X | | |
| RG_G013_WS_20190618-0840 | RG_G013 | WS | No | 18-Jun-19 | 0840 | G | 7 | X | X | X | X | X | X | | |
| RG_MIWW_WS_20190618-1302 | RG_MIWW | WS | No | 18-Jun-19 | 1302 | G | 7 | X | X | X | X | X | X | | |
| RG_LFSRW_WS_20190619-0845 | RG_LFSRW | WS | No | 19-Jun-19 | 0845 | G | 7 | X | X | X | X | X | X | | |

ADDITIONAL COMMENTS/SPECIAL INSTRUCTIONS

RELINQUISHED BY/AFFILIATION

DATE/TIME

ACCEPTED BY/AFFILIATION

DK 6/20 0910

NO OF BOTTLES RETURNED/DESCRIPTION

| | | |
|---|---------------------|-----------|
| Regular (default) x | Sampler's Name | Mobile # |
| Priority (2-3 business days) - 50% surcharge | Sampler's Signature | Date/Time |
| Emergency (1 Business Day) - 100% surcharge | | |
| For Emergency <1 Day, ASAP or Weekend - Contact ALS | | |

60C

1. SAMPLE SET

AAE Tech Services Inc. (AAE) was contracted by Minnow Environmental to provide otolith processing and age estimation services for samples collected under Project 19-12. This included 56 Redside Shiner whole heads as the primary sample and 56 Redside Shiner pectoral fins as the secondary sample. A full data spreadsheet, including sample ID, structure type, ageing process used, and age estimation results is provided.

2. AGEING METHOD: OTOLITHS

The primary samples of whole head Redside Shiners were used to determine age estimation over the secondary pectoral fin samples. Lapillus otolith pairs for Redside Shiner samples were extracted from the whole heads and placed into individual enumerated sample envelopes.

All otoliths in this sample set were analyzed using the "Sectioning" method. This method is used primarily for larger otoliths with a deep sulcus or irregular shape. This method was selected only after the "Read Whole" method (non-destructive, often used in smaller otoliths) was found to be inaccurate.

OTOLITH PREPARATION

Otolith pairs were examined under magnification and evaluated for any issues related to structural integrity (e.g. cracks, fractures, chips, pieces missing) and deformation (crystallization, misshapen lobes). One otolith is selected for processing and is embedded in Cold Cure epoxy resin. Samples are cured for 48 hours before sectioning. Samples are marked for sectioning under magnification using a fine tip marker to identify the nucleus (centre) and section plane (cut edge to be examined) for each otolith. Using the marks as a guide, a Buehler Isomet low speed dual-blade saw is used to cut a single section, with the section plane passing through the nucleus. This surface is then polished with a series of lapping film (30, 12, and 0.3 microns) to improve clarity of the section plane.

To carry out age estimation, an otolith section is submerged in water under magnification with the polished surface facing up.

AGE ESTIMATION

Annuli are counted outward from the nucleus. Checking (false-annuli) is common in many species, including Redside Shiner, in particular within the first 1-3 years of growth. Annuli are assessed for density (contrast between summer and winter growth), clarity (ability to differentiate individual annuli) and continuity (e.g. segmentation, merging, fading). Photographs under magnification are taken of each sample for reference and revision. Ages are recorded with a Confidence Index (CI) based on the condition of the otolith, annuli assessment, and the confidence of the reader in the age recorded, as described in Table 1.

Table 1. Confidence Index (CI) table; applied to each age estimate, reflecting the reader’s confidence in the age recorded.

| Confidence Index (CI) | Abbreviation | Qualitative Meaning | Quantitative Meaning |
|------------------------------|---------------------|--|---|
| Good | G | Pattern very clear with no interpretational problems | Reader would always get the same age |
| Fairly Good | FG | Pattern is clear with few easy interpretational problems | Reader would get the same age most of the time for fish <20 years |
| Fair | F | Pattern is fairly clear with some areas presenting easy and moderate interpretational problems | Reader would be within one year most of the time for fish <20 years |
| Fairly Poor | FP | Pattern is fairly unclear, presenting a number of difficult interpretational problems | Reader would be within 2-3 years for fish <20 years |
| Poor | P | Pattern is very unclear, presenting significant interpretational problems | Reader has little confidence in repeatability of age |

3. AGEING RESULTS

Age estimates were provided in August, 2019 based on the otolith samples extracted from the whole heads provided.

Redside Shiner age estimates ranged from one to five years of age, with a modal age of three years. CI values were fair, with most recorded as F, and some instances of FG and FP samples. Some checking within the first three years was observed, as well as lack of clarity in some samples.

Samples were photographed under magnification for reference and revision. Representative photographs of are presented in Section 5 .

4. QA/QC PROTOCOL

AAE’s QA/QC protocols have been developed in consultation with Fisheries and Oceans Canada ageing experts to ensure accurate age estimations while addressing potential issues related to confidence index, reader bias, and human error. For this project, due to the low number of samples to be aged, 100% of the samples were initially aged independently by two fisheries biologists, followed by a third biologist as ages between the initial two biologists differed. For this species, there was difficulty confidently identifying the true annuli as checking was evident throughout the otoliths. A third biologist read the samples independently of the original two. The results were then discussed with all biologist and together the final ages were determined.



Figure 1. Representative photo of a 1 year old Redside Shiner (Lapillus otolith section).



Figure 2. Representative photo of a 2 year old Redside Shiner (Lapillus otolith section).



Figure 3. Representative photo of a 3 year old Redside Shiner (Lapillus otolith section).



Figure 4. Representative photo of a 4 year old Redside Shiner (Lapillus otolith section).



Figure 5. Representative photo of a 5 year old Redside Shiner (*Lepomis microlophus* otolith section).

Ageing Results

FISH AGE ESTIMATION SUMMARY REPORT – PROJECT 19-12

Prepared for MINNOW ENVIRONMENTAL

August 19, 2019

| Sample ID | Species | Date Caught | Structure | Method | Primary Ager | Age Estimate | CI | QAQC Ager 1 | QAQC Age Estimate | CI | QAQC Ager 2 | QAQC Age Estimate | CI | Final Age Estimate | Notes | Picture (Y/N) |
|-----------------------------|----------------|-------------|-----------|---------|--------------|--------------|----|-------------|-------------------|----|-------------|-------------------|----|--------------------|-------|---------------|
| RG_LNLK-RSC-11-OT_20190517 | Redside Shiner | 17-May-19 | Otolith | Section | CC | 4 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_LNLK-RSC-12-OT_20190517 | Redside Shiner | 17-May-19 | Otolith | Section | CC | 3 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_LNLK-RSC-13-OT_20190517 | Redside Shiner | 17-May-19 | Otolith | Section | CC | 4 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_LNLK-RSC-14-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 4 | F | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_LNLK-RSC-15-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 6 | F | TB | 4 | FG | ML | 4 | FG | 4 | | Y |
| RG_LNLK-RSC-16-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 3 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_LNLK-RSC-17-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 3 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_LNLK-RSC-18-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 5 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_LNLK-RSC-19-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 3 | F | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_LNLK-RSC-20-OT_20190520 | Redside Shiner | 20-May-19 | Otolith | Section | CC | 5 | F | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_STPD-RSC-01-OT_20190515 | Redside Shiner | 15-May-19 | Otolith | Section | CC | 4 | FG | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_STPD-RSC-02-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 4 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_STPD-RSC-03-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 3 | F | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_STPD-RSC-04-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 4 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_STPD-RSC-05-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 4 | FG | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_STPD-RSC-06-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 4 | FG | TB | 4 | FG | ML | 4 | FG | 4 | | Y |
| RG_STPD-RSC-07-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 3 | FP | TB | 1 | FP | ML | 1 | FP | 1 | | Y |
| RG_STPD-RSC-08-OT_20190530 | Redside Shiner | 30-May-19 | Otolith | Section | CC | 2 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_STPD-RSC-09-OT_20190530 | Redside Shiner | 30-May-19 | Otolith | Section | CC | 3 | FG | TB | 2 | FP | ML | 2 | FP | 2 | | Y |
| RG_STPD-RSC-10-OT_20190530 | Redside Shiner | 30-May-19 | Otolith | Section | CC | 4 | FG | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_STPD-RSC-11-OT_20190531 | Redside Shiner | 31-May-19 | Otolith | Section | CC | 4 | F | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_STPD-RSC-12-OT_20190531 | Redside Shiner | 31-May-19 | Otolith | Section | CC | 4 | FG | TB | 4 | FG | ML | 3 | FG | 3 | | Y |
| RG_STPD-RSC-13-OT_20190601 | Redside Shiner | 01-Jun-19 | Otolith | Section | CC | 4 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_STPD-RSC-14-OT_20190604 | Redside Shiner | 04-Jun-19 | Otolith | Section | CC | 4 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_STPD-RSC-15-OT_20190604 | Redside Shiner | 04-Jun-19 | Otolith | Section | CC | 4 | F | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_STPD-RSC-16-OT_20190604 | Redside Shiner | 04-Jun-19 | Otolith | Section | CC | 3 | FG | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_ERIMF-RSC-04-OT_20190515 | Redside Shiner | 15-May-19 | Otolith | Section | CC | 5 | F | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ERIMF-RSC-05-OT_20190517 | Redside Shiner | 17-May-19 | Otolith | Section | CC | 5 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ERIMF-RSC-06-OT_20190521 | Redside Shiner | 21-May-19 | Otolith | Section | CC | 4 | FG | TB | 3 | F | ML | 3 | F | 2 | | Y |
| RG_ERIMF-RSC-07-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 5 | F | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ERIMF-RSC-08-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 6 | F | TB | 5 | FG | ML | 5 | FG | 5 | | Y |
| RG_ERIMF-RSC-09-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 4 | F | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ERIMF-RSC-10-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 6 | FG | TB | 5 | FG | ML | 5 | FG | 5 | | Y |
| RG_ERIMF-RSC-11-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 5 | F | TB | 3 | F | ML | 2 | F | 3 | | Y |
| RG_ERIMF-RSC-12-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 3 | FP | TB | 2 | FP | ML | 1 | FP | 2 | | Y |
| RG_ERIMF-RSC-13-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 4 | F | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_ERIMF-RSC-14-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 4 | F | TB | 3 | FP | ML | 3 | FP | 3 | | Y |
| RG_ERIMF-RSC-15-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 5 | FG | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_ERIMF-RSC-16-OT_20190523 | Redside Shiner | 23-May-19 | Otolith | Section | CC | 3 | F | TB | 1 | FP | ML | 1 | FP | 1 | | Y |
| RG_ERWSF-RSC-01-OT_20190524 | Redside Shiner | 24-May-19 | Otolith | Section | CC | 6 | FP | TB | 4 | F | ML | 4 | F | 4 | | Y |
| RG_ERWSF-RSC-02-OT_20190529 | Redside Shiner | 29-May-19 | Otolith | Section | CC | 5 | FP | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_ERWSF-RSC-03-OT_20190530 | Redside Shiner | 30-May-19 | Otolith | Section | CC | 5 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ER-RSC-01-OT_20190613 | Redside Shiner | 13-Jun-19 | Otolith | Section | CC | 5 | FG | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_ER-RSC-02-OT_20190613 | Redside Shiner | 13-Jun-19 | Otolith | Section | CC | 5 | FG | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ER-RSC-03-OT_20190614 | Redside Shiner | 14-Jun-19 | Otolith | Section | CC | 3 | FP | TB | 1 | FP | ML | 1 | FP | 1 | | Y |
| RG_ER-RSC-04-OT_20190622 | Redside Shiner | 22-Jun-19 | Otolith | Section | CC | 6 | FP | TB | 4 | F | ML | 4 | F | 4 | | Y |
| RG_ER-RSC-05-OT_20190622 | Redside Shiner | 22-Jun-19 | Otolith | Section | CC | 3 | FG | TB | 3 | FG | ML | 3 | FG | 3 | | Y |
| RG_ER-RSC-06-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 2 | FP | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_ER-RSC-07-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 2 | FP | TB | 1 | FP | ML | 1 | FP | 1 | | Y |
| RG_ER-RSC-08-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 3 | FP | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ER-RSC-09-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 4 | FP | TB | 2 | F | ML | 2 | F | 2 | | Y |
| RG_ER-RSC-10-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 3 | FP | TB | 3 | F | ML | 3 | F | 3 | | Y |
| RG_ER-RSC-11-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 4 | F | TB | 2 | FP | ML | 2 | FP | 2 | | Y |
| RG_ER-RSC-12-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 7 | F | TB | 4 | F | ML | 4 | F | 4 | | Y |
| RG_ER-RSC-13-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 4 | FP | TB | 2 | FP | ML | 1 | FP | 1 | | Y |
| RG_ER-RSC-14-OT_20190624 | Redside Shiner | 24-Jun-19 | Otolith | Section | CC | 7 | FP | TB | 3 | F | ML | 3 | F | 3 | | Y |

APPENDIX E

Tissue Chemistry Reports

Appendix E: Comparison of Tissue Results between Analytical Methods

Consistent with previous monitoring programs, subsamples of dorsal muscle tissue and residual ovaries were submitted for chemical analysis at the Saskatchewan Research Council (SRC; Saskatoon, SK). Total selenium was measured by high resolution inductively coupled plasma mass spectrometry (HR ICP-MS). Moisture content was measured by freeze drying. As an alternative to standard HR ICP-MS methods, use of laser ablation ICP-MS at TrichAnalytics (Saanichton, BC) was investigated because analysis of a smaller sample size is possible using this method (i.e., <5 mg dw). This alternative method required method validation to confirm that measurements are comparable to those using HR ICP-MS. To support method validation, samples of dorsal muscle and residual ovaries from field-collected fish were split and analyzed by SRC and TrichAnalytics.

Dorsal muscle and residual ovary samples that were split and analysed for selenium by SRC and TrichAnalytics showed good agreement of results for both tissue types between analytical methods (Figure E-1; correlation coefficient = 0.99 for muscle and 0.96 for ovary). Split dorsal muscle samples ranged from 30 to 1,340 mg wet weight, with percentage moisture ranging from 66 to 83% and split residual ovary samples ranged from 11 to 664 mg wet weight with percentage moisture ranging from 29 to 78% (Table E.1). For reported concentrations more than 10× the method detection limit¹, the relative percent difference between laboratory split measurements of selenium was on average 14% (range 0-39%) for muscle samples and 17% (range 0-128%) for ovary samples (Table E.1). Three of 56 split ovary samples had a relative percentage difference greater than 40%, which the BC MOE recommends as a data quality objective for tissue laboratory duplicates.

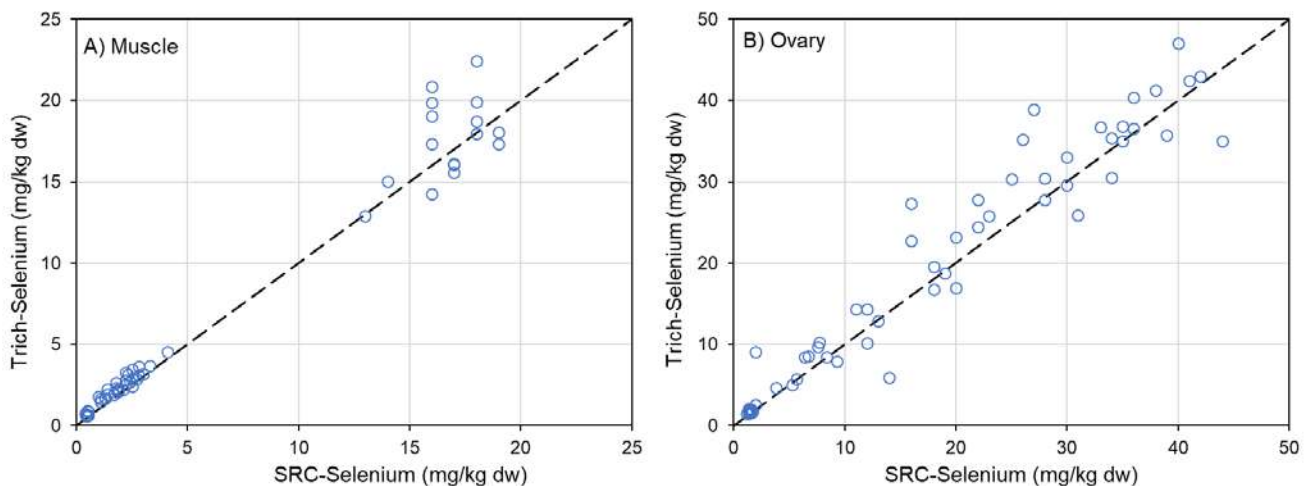


Figure E-1: Comparison of selenium concentrations in dorsal muscle (A) and residual ovary (B) of reidside shiner analyzed by SRC and TrichAnalytics. Dashed line is a 1:1 relationship.

¹ BC MOE (2015) recommends that relative percent difference be calculated for values >10× the method detection limit when comparing laboratory tissue duplicates. BC MOE recommends a data quality objective of ≤40% for all metals except strontium. Method detection limits for this RSC study were as follows: SRC 0.01-0.5 mg/kg dw muscle, 0.02-0.5 mg/kg dw ovary; TrichAnalytics 0.17 mg/kg dw muscle, 0.2-1.5 mg/kg dw ovary.

Table E.1: Relative Percent Difference between Redside Shiner Dorsal Muscle and Ovary Samples Analyzed by SRC and TrichAnalytics

| Sample Description | Dorsal Muscle | | | | | RPD (%) >10X DL | Sample Description | Ovary | | | | | RPD (%) >10X DL |
|----------------------------|-------------------|------------|----------|------------|---------|----------------------------|--------------------|----------|------------|----------|------------|---------|--------------------|
| | Selenium | | DL | | RPD (%) | | | Selenium | | DL | | RPD (%) | |
| | µg/g SRC | µg/g Trich | µg/g SRC | µg/g Trich | | | | µg/g SRC | µg/g Trich | µg/g SRC | µg/g Trich | | |
| RG_ERIMF-RSC-04-M_20190515 | 2.2 | 2.8 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-04-O_20190515 | 7.6 | 9.7 | 0.5 | 0.2 | 24 | | |
| RG_ERIMF-RSC-05-M_20190517 | 2.1 | 2.2 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-05-O_20190517 | 9.3 | 7.9 | 0.5 | 0.2 | 16 | | |
| RG_ERIMF-RSC-06-M_20190521 | 1 | 1.8 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-06-O_20190521 | 3.8 | 4.7 | 0.5 | 0.2 | NC | | |
| RG_ERIMF-RSC-07-M_20190523 | 1.1 | 1.4 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-07-O_20190523 | 5.7 | 5.8 | 0.05 | 0.2 | 0.95 | | |
| RG_ERIMF-RSC-08-M_20190523 | 2.8 | 3.6 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-08-O_20190523 | 12 | 14.4 | 0.05 | 0.2 | 18 | | |
| RG_ERIMF-RSC-09-M_20190523 | 1.3 | 1.7 | 0.05 | 0.17 | 25 | RG_ERIMF-RSC-09-O_20190523 | 7.7 | 10.3 | 0.05 | 0.2 | 29 | | |
| RG_ERIMF-RSC-10-M_20190523 | 1.9 | 2.1 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-10-O_20190523 | 2 | 9.1 | 0.05 | 0.2 | 128 | | |
| RG_ERIMF-RSC-11-M_20190523 | 1.8 | 2.3 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-11-O_20190523 | 12 | 10.2 | 0.5 | 0.2 | 17 | | |
| RG_ERIMF-RSC-12-M_20190523 | 1.8 | 2.6 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-12-O_20190523 | 6.7 | 8.5 | 0.5 | 0.2 | 24 | | |
| RG_ERIMF-RSC-13-M_20190523 | 1.4 | 2.2 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-13-O_20190523 | 5.3 | 5.0 | 0.5 | 0.2 | 5.6 | | |
| RG_ERIMF-RSC-14-M_20190523 | 4.1 | 4.6 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-14-O_20190523 | 20 | 23.2 | 0.5 | 0.2 | 15 | | |
| RG_ERIMF-RSC-15-M_20190523 | 1.1 | 1.7 | 0.5 | 0.17 | NC | RG_ERIMF-RSC-15-O_20190523 | 6.4 | 8.4 | 0.5 | 0.2 | 27 | | |
| RG_ERIMF-RSC-16-M_20190523 | 1.4 | 1.9 | 0.05 | 0.17 | 30 | RG_ERIMF-RSC-16-O_20190523 | 8.4 | 8.5 | 0.5 | 0.2 | 1.0 | | |
| RG_ER-RSC_01-M_20190613 | 1.7 | 1.9 | 0.02 | 0.17 | 13 | RG_ER-RSC-01-O_20190613 | 22 | 24.4 | 0.02 | 0.2 | 10 | | |
| RG_ER-RSC_02-M_20190613 | 1.3 | 1.7 | 0.02 | 0.17 | 26 | RG_ER-RSC-02-O_20190613 | 18 | 16.8 | 0.02 | 0.2 | 6.9 | | |
| RG_ER-RSC_03-M_20190621 | 3.3 | 3.7 | 0.02 | 0.17 | 11 | RG_ER-RSC-03-O_20190614 | 25 | 30.3 | 0.05 | 1.53 | 19 | | |
| RG_ER-RSC_04-M_20190622 | 3 | 3.2 | 0.02 | 0.17 | 6.4 | RG_ER-RSC-04-O_20190622 | 22 | 27.8 | 0.05 | 1.53 | 23 | | |
| RG_ER-RSC_05-M_20190622 | 2.5 | 2.4 | 0.01 | 0.17 | 2.8 | RG_ER-RSC-05-O_20190622 | 27 | 38.9 | 0.05 | 1.53 | 36 | | |
| RG_ER-RSC_06-M_20190624 | 1.9 | 2.2 | 0.02 | 0.17 | 16 | RG_ER-RSC-06-O_20190624 | 19 | 18.7 | 0.05 | 1.53 | 1.4 | | |
| RG_ER-RSC_07-M_20190624 | 2.5 | 3.5 | 0.02 | 0.17 | 32 | RG_ER-RSC-07-O_20190624 | 14 | 5.9 | 0.05 | 1.53 | NC | | |
| RG_ER-RSC_08-M_20190624 | 2.4 | 2.7 | 0.02 | 0.17 | 12 | RG_ER-RSC-08-O_20190624 | 36 | 40.4 | 0.05 | 1.53 | 11 | | |
| RG_ER-RSC_09-M_20190624 | 2.2 | 2.8 | 0.02 | 0.17 | 23 | RG_ER-RSC-09-O_20190624 | 26 | 35.2 | 0.05 | 1.53 | 30 | | |
| RG_ER-RSC_10-M_20190624 | 1.7 | 1.9 | 0.02 | 0.17 | 12 | RG_ER-RSC-10-O_20190624 | 16 | 27.3 | 0.05 | 1.53 | 52 | | |
| RG_ER-RSC_11-M_20190624 | 1.9 | 2.2 | 0.02 | 0.17 | 14 | RG_ER-RSC-11-O_20190624 | 18 | 19.6 | 0.05 | 1.53 | 8.3 | | |
| RG_ER-RSC_12-M_20190624 | 2.8 | 3.1 | 0.01 | 0.17 | 9.4 | RG_ER-RSC-12-O_20190624 | 38 | 41.3 | 0.05 | 1.53 | 8.3 | | |
| RG_ER-RSC_13-M_20190624 | 2.5 | 2.9 | 0.02 | 0.17 | 14 | RG_ER-RSC-13-O_20190624 | 23 | 25.8 | 0.05 | 1.53 | 12 | | |
| RG_ER-RSC_14-M_20190624 | 2.7 | 2.9 | 0.01 | 0.17 | 5.6 | RG_ER-RSC-14-O_20190624 | 16 | 22.7 | 0.05 | 1.53 | 35 | | |
| RG_ERWSF-RSC-01-M_20190524 | 2.2 | 3.3 | 0.05 | 0.17 | 39 | RG_ERWSF-RSC-01-O_20190524 | 20 | 16.9 | 0.05 | 0.9 | 1.7 | | |
| RG_ERWSF-RSC-02-M_20190529 | 2.3 | 3.1 | 0.05 | 0.17 | 31 | RG_ERWSF-RSC-02-O_20190529 | 13 | 12.9 | 0.05 | 0.2 | 11 | | |
| RG_ERWSF-RSC-03-M_20190530 | 2.2 | 2.5 | 0.5 | 0.17 | NC | RG_ERWSF-RSC-03-O_20190530 | 11 | 14.3 | 0.05 | 0.2 | 26 | | |
| RG_LNLK-RSC-11-M_20190517 | 0.4 | 0.7 | 0.05 | 0.17 | NC | RG_LNLK-RSC-11-O_20190517 | 1.2 | 1.5 | 0.5 | 0.2 | NC | | |
| RG_LNLK-RSC-12-M_20190517 | <0.5 ^a | 0.6 | 0.5 | 0.17 | NC | RG_LNLK-RSC-12-O_20190517 | 1.4 | 1.47 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-13-M_20190517 | 0.51 | 0.9 | 0.05 | 0.17 | NC | RG_LNLK-RSC-13-O_20190517 | 1.3 | 1.81 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-14-M_20190520 | 0.47 | 0.6 | 0.05 | 0.17 | NC | RG_LNLK-RSC-14-O_20190520 | 1.4 | 1.71 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-15-M_20190520 | 0.53 | 0.7 | 0.05 | 0.17 | NC | RG_LNLK-RSC-15-O_20190520 | 1.4 | 2.11 | 0.05 | 0.2 | 41 | | |
| RG_LNLK-RSC-16-M_20190520 | 0.48 | 0.6 | 0.05 | 0.17 | NC | RG_LNLK-RSC-16-O_20190520 | 1.5 | 1.78 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-17-M_20190520 | <0.5 ^a | 0.6 | 0.5 | 0.17 | NC | RG_LNLK-RSC-17-O_20190520 | 2 | 2.57 | 0.5 | 0.2 | NC | | |
| RG_LNLK-RSC-18-M_20190520 | 0.52 | 0.7 | 0.05 | 0.17 | NC | RG_LNLK-RSC-18-O_20190520 | 1.7 | 1.77 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-19-M_20190520 | 0.42 | 0.6 | 0.05 | 0.17 | NC | RG_LNLK-RSC-19-O_20190520 | 1.6 | 1.59 | 0.05 | 0.2 | NC | | |
| RG_LNLK-RSC-20-M_20190520 | 0.54 | 0.9 | 0.05 | 0.17 | NC | RG_LNLK-RSC-20-O_20190520 | 1.6 | 2.0 | 0.05 | 0.2 | NC | | |
| RG_STPD-RSC-01-M_20190515 | 13 | 12.9 | 0.05 | 0.17 | 0.84 | RG_STPD-RSC-01-O_20190515 | 35 | 36.8 | 0.05 | 0.9 | 5.0 | | |
| RG_STPD-RSC-02-M_20190524 | 17 | 16.1 | 0.05 | 0.17 | 5.7 | RG_STPD-RSC-02-O_20190524 | 35 | 35 | 0.05 | 0.9 | 0 | | |
| RG_STPD-RSC-03-M_20190524 | 19 | 18.1 | 0.05 | 0.17 | 5.1 | RG_STPD-RSC-03-O_20190524 | 31 | 25.9 | 0.05 | 0.9 | 18 | | |
| RG_STPD-RSC-04-M_20190524 | 16 | 14.3 | 0.05 | 0.17 | 11 | RG_STPD-RSC-04-O_20190524 | 39 | 35.7 | 0.05 | 0.9 | 8.8 | | |
| RG_STPD-RSC-05-M_20190524 | 17 | 16.1 | 0.5 | 0.17 | 5.5 | RG_STPD-RSC-05-O_20190524 | 34 | 30.5 | 0.05 | 0.9 | 11 | | |
| RG_STPD-RSC-06-M_20190524 | 16 | 17.3 | 0.05 | 0.17 | 8.1 | RG_STPD-RSC-06-O_20190524 | 28 | 27.8 | 0.05 | 0.9 | 0.72 | | |
| RG_STPD-RSC-07-M_20190524 | 14 | 15.0 | 0.5 | 0.17 | 7.0 | RG_STPD-RSC-07-O_20190524 | 41 | 42.4 | 0.5 | 0.9 | 3.4 | | |
| RG_STPD-RSC-08-M_20190530 | 17 | 15.6 | 0.5 | 0.17 | 8.9 | RG_STPD-RSC-08-O_20190530 | 36 | 36.6 | 0.5 | 0.2 | 1.6 | | |
| RG_STPD-RSC-09-M_20190530 | 18 | 22.5 | 0.5 | 0.17 | 22 | RG_STPD-RSC-09-O_20190530 | 28 | 30.4 | 0.5 | 0.2 | 8.3 | | |
| RG_STPD-RSC-10-M_20190530 | 16 | 19.0 | 0.5 | 0.17 | 17 | RG_STPD-RSC-10-O_20190530 | 30 | 33.1 | 0.05 | 0.2 | 9.7 | | |
| RG_STPD-RSC-11-M_20190531 | 18 | 19.9 | 0.5 | 0.17 | 10.0 | RG_STPD-RSC-11-O_20190531 | 44 | 35.0 | 0.05 | 0.2 | 23 | | |
| RG_STPD-RSC-12-M_20190531 | 16 | 20.8 | 0.5 | 0.17 | 26 | RG_STPD-RSC-12-O_20190531 | 34 | 35.4 | 0.5 | 0.2 | 3.9 | | |
| RG_STPD-RSC-13-M_20190601 | 16 | 19.9 | 0.5 | 0.17 | 22 | RG_STPD-RSC-13-O_20190601 | 42 | 43.0 | 0.5 | 0.2 | 2.3 | | |
| RG_STPD-RSC-14-M20190604 | 18 | 18.0 | 0.5 | 0.17 | 0.19 | RG_STPD-RSC-14-O_20190604 | 30 | 29.6 | 0.5 | 0.8 | 1.4 | | |
| RG_STPD-RSC-15-M20190604 | 19 | 17.3 | 0.05 | 0.17 | 9.2 | RG_STPD-RSC-15-O_20190604 | 33 | 36.8 | 0.5 | 0.8 | 11 | | |
| RG_STPD-RSC-16-M20190604 | 18 | 18.7 | 0.5 | 0.17 | 3.9 | RG_STPD-RSC-16-O_20190604 | 40 | 47.1 | 0.5 | 0.8 | 16 | | |

Notes:

a. detection limit used in RPD calculation.

% = percent; µg/g = micrograms per gram dry weight; DL = detection limit; RPD = relative percent difference; SRC = Saskatchewan Research Council Laboratory; Trich = TrichAnalytics Laboratory

Value RPD > 40%

SRC Dorsal Muscle Analysis



SRC Environmental Analytical Laboratories
102-422 Downey Rd, Saskatoon, SK S7N 4N1
Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY / ANALYSIS FORM

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
* Contact lab in advance to authorize

Invoice to:

Company Name: Teck Coal Ltd.
Contact Name: Call Good
Address: P.O. Box 1777, 1248 Aspen Drive
City/Prov: Sparwood, British Columbia
Postal Code: V0B 2G0 Phone: 250-865-5289

Email: Call.Good@teck.com

PO# 19-12

Quote #: _____

Lab Use Only:
Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr
Serm Flag
of bottles _____
Preservatives _____
Size _____
In Subgroup # _____
Received by: _____

SRC Group # _____
Client Code _____
Date/Time received _____
Storage _____

Report Format: PDF Excel Water Security Agency WaterTrax Database

Report to: Same as Invoice to?

Company Name: _____
Contact Name: _____
Address: _____
City/Prov: _____
Postal Code: _____
Phone: _____
Email: carla.fraser@teck.com
Email: Carla.Meyer@teck.com
Email: mgatfisher@teck.com lashby@golder.com

Special Instructions/Notes:

- SRC to homogenize samples (ceramic blade + sterile manual chop) - no metal implements.
- AFTER HOMOGENIZATION, SPLIT SAMPLE (Wet), SEND ONE PART OF SPLIT TO TRICK ANALYSIS; ANALYZE SECOND SPLIT.
- SEE ATTACHED EMAIL FOR DETAILS.

Analysis Required

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Moisture (Free-ly) | Full Metals (HR ICP-MS) | Wet homo. for trich + ppt | | | | | | | | | | | | |
|----------------------------------|-----------------------|---------------------------------|-------------------|--------------------|-------------------------|---------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| <u>RG_LNLK-RSC-11-M_20190517</u> | 1 | Fish Muscle | 17-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-12-M_20190517</u> | 1 | Fish Muscle | 17-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-13-M_20190517</u> | 1 | Fish Muscle | 17-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-14-M_20190520</u> | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-15-M_20190520</u> | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-16-M_20190520</u> | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-17-M_20190520</u> | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |
| <u>RG_LNLK-RSC-18-M_20190520</u> | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | | | | | | | | | | | | |

I Kirsten Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard

Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: Kirsten Dressler



SRC Environmental Analytical Laboratories
102-422 Downey Rd, Saskatoon, SK S7N 4N1
Ph. (306)933-8932, Toll free 800-240-8808

CHAIN OF CUSTODY / ANALYSIS FORM

Page 2 of 2

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
* Contact lab in advance to authorize

Invoice to:
Company Name: Teck Coal Ltd.
Contact Name: Carl Good
Address: P.O. Box 1777, 1249 Alpha Drive
City/Prov: Sprucedale, British Columbia
Postal Code: V0B 2S0 Phone: 250-886-5288
Email: Carl.Good@teck.com
PO# 18-12 Quote #:

Lab Use Only:
Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr
SRC Group # _____
Client Code _____
Date/Time received _____
Storage: _____

Serum Flag

| | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|
| # of bottles | | | | | | | | | |
| Preservatives | | | | | | | | | |
| Size | | | | | | | | | |
| In Subgroup # | | | | | | | | | |

Received by: _____

Report Format: PDF Excel Water Security Agency WaterTrax Database

Report to: Same as Invoice to? Special Instructions/Notes:

Company Name: _____
Contact Name: _____
Address: _____
City/Prov: _____
Postal Code: _____
Phone: _____
Email: carl.good@teck.com
Email: Carl.Good@teck.com
Email: slight@teck.com

- HOMOGENIZE
- SPLIT (SEND WET SAMPLE TO DIFFERENT LABS ANALYZE OTHER SPLIT)

l.shelley@golder.com - SEE EMAIL ATTACHED FOR DETAILS

Analysis Required

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Moisture (over-dry) | Full Metals (HR ICP-MS) | Metals (ICP-MS) | Metals (ICP-OES) | Metals (ICP-AES) | Metals (ICP-MS) | Metals (ICP-OES) | Metals (ICP-AES) |
|---------------------------|-----------------------|---------------------------------|-------------------|---------------------|-------------------------|-----------------|------------------|------------------|-----------------|------------------|------------------|
| RG_INLK-RSC-19-M_20190520 | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_INLK-RSC-20-M_20190520 | 1 | Fish Muscle | 20-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-01-M_20190515 | 1 | Fish Muscle | 15-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-02-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-03-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-04-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-05-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| RG_STPD-RSC-06-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

I, Kristen Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard

Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: Kristen Dressler



SRC Environmental Analytical Laboratories
102-422 Downey Rd, Saskatoon, SK S7N 4N1
Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY / ANALYSIS FORM

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
* Contact lab in advance to authorize

Invoice to:
Company Name: Teck Coal Ltd.
Contact Name: Calli Reed
Address: P.O. Box 1777, 1900 Aspen Drive
City/Prov: Sparwood, British Columbia
Postal Code: V0B 2B0 Phone: 250-695-8288
Email: Calli.Reed@teck.com
PO# 18-12 Quote #:

Lab Use Only:
Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr
SRC Group # _____
Client Code _____
Date/Time received _____
Storage: _____
Form Flag
of bottles _____
Preservatives _____
Size _____
In Subgroup # _____
Received by: _____

Report Format: PDF Excel Water Security Agency WaterTrax Database
Report Results to:

Report to: Same as Invoice to?
Company Name: _____
Contact Name: _____
Address: _____
City/Prov: _____
Postal Code: _____
Phone: _____
Email: calli.reed@teck.com
Email: Calli.Meyer@teck.com
Email: rjg@teck.com - ashby@polder.com

Special Instructions/Notes:
- HOMOGENIZE SAMPLES
- SPLIT (SEND WET SAMPLE TO DIFF. LAB FOR ANALYSIS; ANALYZE 2nd SPLIT)
- SEE ATTACHED EMAIL FOR DETAILS.

Analysis Required

| Moisture (Aves. wt) | Full Metals (HR ICP-MS) | Asst. for migration type |
|---------------------|-------------------------|--------------------------|
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |
| ✓ | ✓ | ✓ |

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled |
|----------------------------|-----------------------|---------------------------------|-------------------|
| RG_STPD-RSC-07-M_20190524 | 1 | Fish Muscle | 24-05-19 |
| RG_STPD-RSC-08-M_20190530 | 1 | Fish Muscle | 30-05-19 |
| RG_STPD-RSC-09-M_20190530 | 1 | Fish Muscle | 30-05-19 |
| RG_STPD-RSC-10-M_20190530 | 1 | Fish Muscle | 30-05-19 |
| RG_STPD-RSC-11-M_20190531 | 1 | Fish Muscle | 31-05-19 |
| RG_STPD-RSC-12-M_20190531 | 1 | Fish Muscle | 31-05-19 |
| RG_STPD-RSC-13-M_20190601 | 1 | Fish Muscle | 01-06-19 |
| RG_ERIMF-RSC-04-M_20190515 | 1 | Fish Muscle | 15-05-19 |

Krista Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard Terms and Conditions on the 24 day of July 2019. Relinquished by Signature: Krista Dressler



SRC Environmental Analytical Laboratories
102-422 Downey Rd, Saskatoon, SK S7N 4N1
Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY / ANALYSIS FORM

Page # 48 of 48

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
* Contact lab in advance to authorize

Invoice to:
Company Name: Tech Coal Ltd.
Contact Name: Carl Good
Address: P.O. Box 1777, 1248 Argon Drive
City/Prov: Spokane, British Columbia
Postal Code: V0B 8G0 Phone: 250-868-5389
Email: Carl.Good@tech.com
PON # 19-12 Quote #: _____

Lab Use Only:
Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr
SRC Group # _____
Client Code _____
Date/Time received _____
Storage _____

Serve Flag

| | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|
| # of bottles | | | | | | | | | |
| Preservatives | | | | | | | | | |
| Size | | | | | | | | | |
| In Subgroup # | | | | | | | | | |

Received by: _____

Report Format: PDF Excel Water Security Agency WaterTrex Database

Report to: Same as Invoice to?
Company Name: _____
Contact Name: _____
Address: _____
City/Prov: _____
Postal Code: _____
Phone: _____
Email: carla.brauer@tech.com
Email: Carl.Good@tech.com
Email: ashley.golder.com

Special Instructions/Notes:
- Homogenize
- Split (Send wet sample to different lab; analyze other split)
- See attached email for details

| Moisture (As received) | Full Metals (HR ICP-MS) | As of Homogenization | Analysis Required |
|------------------------|-------------------------|----------------------|-------------------|
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |
| ✓ | ✓ | ✓ | |

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled |
|----------------------------|-----------------------|---------------------------------|-------------------|
| RG_ERIMF-RSC-05-M_20190517 | 1 | Fish Muscle | 17-05-19 |
| RG_ERIMF-RSC-06-M_20190521 | 1 | Fish Muscle | 21-05-19 |
| RG_ERIMF-RSC-07-M_20190523 | 1 | Fish Muscle | 23-05-19 |
| RG_ERIMF-RSC-08-M_20190523 | 1 | Fish Muscle | 23-05-19 |
| RG_ERIMF-RSC-09-M_20190523 | 1 | Fish Muscle | 23-05-19 |
| RG_ERIMF-RSC-10-M_20190523 | 1 | Fish Muscle | 23-05-19 |
| RG_ERIMF-RSC-11-M_20190523 | 1 | Fish Muscle | 23-05-19 |
| RG_ERIMF-RSC-12-M_20190523 | 1 | Fish Muscle | 23-05-19 |

Kristen Dross hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: Kristen Dross



SRC Environmental Analytical Laboratories
102-422 Downey Rd, Saskatoon, SK S7N 4N1
Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY / ANALYSIS FORM

Page # 5 of 8

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
* Contact lab in advance to authorize

Invoice to:
Company Name: Teck Coal Ltd.
Contact Name: Carl Good
Address: P.O. Box 1777, 1948 Aspen Drive
City/Prov: Sparwood, British Columbia
Postal Code: V0H 8B0 Phone: 250-605-6289
Email: Carl.Good@teck.com
PO# 16-12 Quote #:

Lab Use Only:
Radiometry: background 0.05-0.2mR/hr >0.2mR/hr
SRC Group # _____
Client Code _____
Date/Time received _____
Storage _____

Serum Flag

| # of bottles | Preservatives | Size | In Subgroup # |
|--------------|---------------|------|---------------|
| | | | |
| | | | |
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Received by: _____

Report Format: PDF Excel Water Security Agency WaterTrax Database

Report to: Same as Invoice to? Special Instructions/Notes:

Company Name: _____
Contact Name: _____
Address: _____
City/Prov: _____
Postal Code: _____
Phone: _____
Email: carla.hoer@teck.com
Email: Carla.Meyer@teck.com
Email: laskby@jalden.com

- Homogenize samples
- Split (Send wet sample to ThermoFisher; analyze second split)
- See attached email for details

Analysis Required

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Moisture (Free, dry) | Full Metals (HR ICP-MS) |
|----------------------------|-----------------------|---------------------------------|-------------------|----------------------|-------------------------|
| RG_ERIMF-RSC-13-M_20190523 | 1 | Fish Muscle | 23-05-19 | ✓ | ✓ |
| RG_ERIMF-RSC-14-M_20190523 | 1 | Fish Muscle | 23-05-19 | ✓ | ✓ |
| RG_ERIMF-RSC-15-M_20190523 | 1 | Fish Muscle | 23-05-19 | ✓ | ✓ |
| RG_ERIMF-RSC-16-M_20190523 | 1 | Fish Muscle | 23-05-19 | ✓ | ✓ |
| RG_ERWSF-RSC-01-M_20190524 | 1 | Fish Muscle | 24-05-19 | ✓ | ✓ |
| RG_ERWSF-RSC-02-M_20190529 | 1 | Fish Muscle | 29-05-19 | ✓ | ✓ |
| RG_ERWSF-RSC-03-M_20190530 | 1 | Fish Muscle | 30-05-19 | ✓ | ✓ |

Kirsta Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: [Signature]



SRC Environmental Analytical Laboratories
 143-111 Research Dr. Saskatoon, SK S7N 3R2
 Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY /ANALYSIS FORM

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
 * Contact lab in advance to authorize

Invoice to:

Company Name: Teck Coal Ltd.
 Contact Name: Cait Good
 Address: P.O. Box 1777, 124B Aspen Drive
 City/Prov: Sperwood, British Columbia
 Postal Code: V0B 2G0 Phone: 250-865-5269
 Email: cait.good@teck.com
 PO# 19-12 Quote #: _____

Lab Use Only:

Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr

WSA Flag

SRG Group # _____
 Client Code _____
 Date/Time received _____
 Storage _____

| | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| # of bottles | | | | | | | | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | | | | |
| Size | | | | | | | | | | | | | | | | | | | | |
| In Subgroup # | | | | | | | | | | | | | | | | | | | | |

Received by: _____

Report Format: PDF Excel
Report Results to: Water Security Agency WaterTrax Database

Report to: Same as Invoice to?

Company Name: _____
 Contact Name: _____
 Address: _____
 City/Prov: _____
 Postal Code: _____
 Phone: _____
 Email: carla.fraser@teck.com
 Email: carlie.meyer@teck.com
 Email: lashby@golder.com

Special Instructions/Notes:

Please see attached email for details. SRC to re-composite, homogenize, split (wet), analyze one split (freeze-dry), and send second split to TrichAnalytics (wet).

Tests Required

| Wet homogenization + split | Moisture (freeze dry) | Full metals (HR ICP-MS) (metals incl. Se and Hg) | | | | | | | | | | | | | | | | | | | |
|----------------------------|-----------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Wet homogenization + split | Moisture (freeze dry) | Full metals (HR ICP-MS) (metals incl. Se and Hg) | | | | | | | | | | | | | | | | |
|-------------------------|-----------------------|---------------------------------|-------------------|----------------------------|-----------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| RG_ER_RSC_01-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_02-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_03-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_04-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_05-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_06-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_07-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_08-M-20190624 | 2 | Fish muscle | 24-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |

I Kirsta Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard
 (Printed Name)

Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: [Signature]
 (Day) (Month) (Year)



SRC Environmental Analytical Laboratories
 143-111 Research Dr. Saskatoon, SK S7N 3R2
 Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY /ANALYSIS FORM

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
 * Contact lab in advance to authorize

Invoice to:

Company Name: Teck Coal Ltd
 Contact Name: Cait Good
 Address: P.O. Box 1777, 124B Aspen Drive
 City/Prov: Sparwood, British Columbia
 Postal Code: V0B 2G0 Phone: 250-865-5289
 Email: cait.good@teck.com
 PO# 19-12 Quote #: _____

Lab Use Only:

Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr

WSA Flag

SRC Group # _____
Client Code _____
Date/Time received _____
Storage _____

| | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| # of bottles | | | | | | | | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | | | | |
| Size | | | | | | | | | | | | | | | | | | | | |
| In Subgroup # | | | | | | | | | | | | | | | | | | | | |

Received by: _____

Report Format: PDF Excel Water Security Agency WaterTrax Database

Report to: Same as Invoice to?

Company Name: _____
 Contact Name: _____
 Address: _____
 City/Prov: _____
 Postal Code: _____
 Phone: _____
 Email: carla.fraser@teck.com
 Email: carlie.meyer@teck.com
 Email: lashby@golder.com

Special Instructions/Notes: Please see attached email for details. SRC to re-composite, homogenize, split (wet), analyze one split (freeze-dry), and send second split to TrichAnalytics (wet).

Tests Required

| Wet homogenization + split | Moisture (freeze-dry) | Full metals (HR ICP-MS) | (metals including Hg and Se) | | | | | | | | | | | | | | | | | | |
|----------------------------|-----------------------|-------------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |
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| ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | | | | |

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Wet homogenization + split | Moisture (freeze-dry) | Full metals (HR ICP-MS) | (metals including Hg and Se) | | | | | | | | | | | | | | | |
|---------------------------|-----------------------|---------------------------------|-------------------|----------------------------|-----------------------|-------------------------|------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| RG_ER_RSC_09-M-20190624 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_010-M-20190624 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_11_R-M_20190622 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_12_R-M_20190622 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_13_R-M_20190622 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_ER_RSC_14_R-M_20190622 | 2 | Fish muscle | 22-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_STPD_RSC_14-M2019 | 1 | Fish muscle | 4-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |
| RG_STPD_RSC_15-M2019 | 1 | Fish muscle | 4-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | | | |

I Kirsten Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard (Printed Name)

Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: Kirsten Dressler
 (Day) (Month) (Year)



SRC Environmental Analytical Laboratories
 143-111 Research Dr. Saskatoon, SK S7N 3R2
 Ph. (306)933-6932, Toll free 800-240-8808

CHAIN OF CUSTODY /ANALYSIS FORM

Turnaround Time: Regular Rush (100% surcharge)
 Rush (100% surcharge + overtime charges authorized*)
 * Contact lab in advance to authorize

Invoice to:

Company Name: Teck Coal Ltd.
 Contact Name: Cait Good
 Address: P.O. Box 1777, 1248 Aspen Drive
 City/Prov: Spanwood, British Columbia
 Postal Code: V0B 2G0 Phone: 250-865-5289
 Email: cait.good@teck.com
 PO# 19-12 Quote #: _____

Lab Use Only:

Radioactivity: background 0.05-0.2mR/hr >0.2mR/hr

WSA Flag

SRC Group # _____
 Client Code _____
 Date/Time received _____
 Storage _____

| | | | | | | | | | | | | | | | | | | | | |
|---------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| # of bottles | | | | | | | | | | | | | | | | | | | | |
| Preservatives | | | | | | | | | | | | | | | | | | | | |
| Size | | | | | | | | | | | | | | | | | | | | |
| In Subgroup # | | | | | | | | | | | | | | | | | | | | |

Received by: _____

Report Format: PDF Excel
 Report Results to: Water Security Agency WaterTrax Database

Report to: Same as Invoice to?

Company Name: _____
 Contact Name: _____
 Address: _____
 City/Prov: _____
 Postal Code: _____
 Phone: _____
 Email: carla.fraser@teck.com
 Email: carlie.meyer@teck.com
 Email: lashby@golder.com

Special Instructions/Notes: Please see attached email for details. SRC to re-composite, homogenize, split (wet), analyze one split (freeze-dry), and send second split to TrichAnalytics (wet).

Tests Required

| Sample Site Description | # of Bottles per site | Sample Type (water, soil, etc.) | Date/Time Sampled | Wet homogenization + split | Moisture (freeze-dry) | Full metals (HR ICP-MS) (metals including Se and Hg) | | | | | | | | | | | | | | |
|-------------------------|-----------------------|---------------------------------|-------------------|----------------------------|-----------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| RG_STPD_RSC_16-M2019 | 1 | Fish muscle | 4-Jun-2019 | ✓ | ✓ | ✓ | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | |

I Kirstin Dressler hereby relinquish the above listed samples to SRC Analytical and authorize the above listed analysis as per the Standard
 (Printed Name)
 Terms and Conditions on the 24 day of July, 2019. Relinquished by Signature: [Signature]
 (Day) (Month) (Year)

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited
421 Pine Avenue
Sparwood, BC V0B 2G0
Attn: Cait Good

Date Samples Received: Jul-25-2019

Client P.O.: VPO00616225 19-12

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Section 2 authorized by Keith Gipman, Supervisor
Results from Lab Section 6 authorized by Marion McConnell, Supervisor

- * Test methods and data are validated by the laboratory's Quality Assurance Program.
- * Routine methods follow recognized procedures from sources such as
 - * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
 - * Environment Canada
 - * US EPA
 - * CANMET
- * The results reported relate only to the test samples as provided by the client.
- * Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.
- * Additional information is available upon request.

This is a final report.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited
421 Pine Avenue
Sparwood, BC V0B 2G0
Attn: Cait Good

Sample #: **2019041379** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 17, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/17/2019 RG_LNLK-RSC-11-M_20190517**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 12 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 4.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.7 | 0.5 |
| Iron | ug/g | 22 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.3 | 0.5 |
| Mercury | ug/g | 0.37 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.40 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.0 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | 0.6 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 49 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.55 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041380**
Date Sampled: **May 17, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/17/2019 RG_LNLK-RSC-12-M_20190517**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 10 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.19 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | <0.5 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 70 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.51 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041381**
Date Sampled: **May 17, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/17/2019 RG_LNLK-RSC-13-M_20190517**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.05 |
| Barium | ug/g | 4.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 2.1 | 0.5 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.2 | 0.5 |
| Mercury | ug/g | 0.30 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.51 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.9 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | 0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 61 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.62 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041382** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/20/2019 RG_LNLK-RSC-14-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 9 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 6.5 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 1.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.9 | 0.5 |
| Iron | ug/g | 30 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.2 | 0.5 |
| Mercury | ug/g | 0.58 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.47 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.7 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 65 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.31 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041383** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/20/2019 RG_LNLK-RSC-15-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.05 |
| Barium | ug/g | 9.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.7 | 0.5 |
| Iron | ug/g | 32 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.4 | 0.5 |
| Mercury | ug/g | 0.77 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.53 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.1 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 100 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.55 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041384** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/20/2019 RG_LNLK-RSC-16-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.13 | 0.05 |
| Barium | ug/g | 3.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.6 | 0.5 |
| Iron | ug/g | 13 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.1 | 0.5 |
| Mercury | ug/g | 0.38 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.48 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.4 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 43 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.00 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041385** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/20/2019 RG_LNLK-RSC-17-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 9 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.34 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | <0.5 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 60 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.30 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041386** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/20/2019 RG_LNLK-RSC-18-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 5.6 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.6 | 0.5 |
| Iron | ug/g | 17 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.3 | 0.5 |
| Mercury | ug/g | 0.44 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.52 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.7 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 50 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.35 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041387**
Date Sampled: **May 20, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/20/2019 RG_LNLK-RSC-19-M_20190520**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.07 | 0.05 |
| Barium | ug/g | 7.7 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.7 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 2.9 | 0.5 |
| Iron | ug/g | 24 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.4 | 0.5 |
| Mercury | ug/g | 0.20 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.42 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | 0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 79 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.96 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041388** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 20, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/20/2019 RG_LNLK-RSC-20-M_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 6.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.2 | 0.5 |
| Iron | ug/g | 17 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 3.7 | 0.5 |
| Mercury | ug/g | 0.32 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 0.54 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 6.4 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 64 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.95 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041389** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 15, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/15/2019 RG_STPD-RSC-01-M_20190515**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 4.9 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.4 | 0.5 |
| Iron | ug/g | 22 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 3.0 | 0.5 |
| Mercury | ug/g | 0.20 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 13 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 8.7 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 86 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.35 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041390** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 24, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/24/2019 RG_STPD-RSC-02-M_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.05 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 2.3 | 0.5 |
| Iron | ug/g | 20 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.2 | 0.5 |
| Mercury | ug/g | 0.18 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 17 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.0 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 59 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.51 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041391**
Date Sampled: **May 24, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/24/2019 RG_STPD-RSC-03-M_20190524**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.05 |
| Barium | ug/g | 2.5 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.6 | 0.5 |
| Iron | ug/g | 17 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 2.3 | 0.5 |
| Mercury | ug/g | 0.20 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 19 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 7.8 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 50 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.42 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041392** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 24, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/24/2019 RG_STPD-RSC-04-M_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.05 |
| Barium | ug/g | 1.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.03 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.4 | 0.5 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.2 | 0.5 |
| Mercury | ug/g | 0.25 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 16 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 58 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.55 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041393** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 24, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/24/2019 RG_STPD-RSC-05-M_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.25 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 17 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.93 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041394** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 24, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/24/2019 RG_STPD-RSC-06-M_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.09 | 0.05 |
| Barium | ug/g | 3.4 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.03 | 0.02 |
| Chromium | ug/g | 9.0 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.8 | 0.5 |
| Iron | ug/g | 83 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 2.7 | 0.5 |
| Mercury | ug/g | 0.14 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 16 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 7.3 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 62 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.48 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041395** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 24, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/24/2019 RG_STPD-RSC-07-M_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.19 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 14 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.76 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041396** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 30, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/30/2019 RG_STPD-RSC-08-M_20190530**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.18 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 17 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.99 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041397**
Date Sampled: **May 30, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/30/2019 RG_STPD-RSC-09-M_20190530**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.15 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 18 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 3 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.98 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041398** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 30, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/30/2019 RG_STPD-RSC-10-M_20190530**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.18 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 16 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.83 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041399**
 Date Sampled: **May 31, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/31/2019 RG_STPD-RSC-11-M_20190531**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.19 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 18 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.25 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041400** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 31, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/31/2019 RG_STPD-RSC-12-M_20190531**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.22 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 16 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.60 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041401** Client PO #: **VPO00616225 19-12**
 Date Sampled: **Jun 01, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **06/01/2019 RG_STPD-RSC-13-M_20190601**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.21 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 16 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 78.49 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041402**
Date Sampled: **May 15, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/15/2019 RG_ERIMF-RSC-04-M_20190515**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 6 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.36 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 2.2 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 4 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.07 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041403**
 Date Sampled: **May 17, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/17/2019 RG_ERIMF-RSC-05-M_20190517**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.32 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 2.1 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 80 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.42 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041404**
Date Sampled: **May 21, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/21/2019 RG_ERIMF-RSC-06-M_20190521**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 9 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.18 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.0 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 8 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 60 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.48 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041405**
Date Sampled: **May 23, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-07-M_20190523**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.44 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.1 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.28 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041406** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 23, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-08-M_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.44 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 2.8 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 3 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.39 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041407**
Date Sampled: **May 23, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-09-M_20190523**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 4.3 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.9 | 0.5 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.4 | 0.5 |
| Mercury | ug/g | 0.30 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.3 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 56 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.30 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041408** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 23, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/23/2019 RG_ERIMF-RSC-10-M_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 9 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 6 | 5 |
| Mercury | ug/g | 0.30 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.9 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 13 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 70 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.48 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041409** Client PO #: **VPO00616225 19-12**
Date Sampled: **May 23, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-11-M_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.30 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.8 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 60 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.43 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041410** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 23, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/23/2019 RG_ERIMF-RSC-12-M_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.30 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.8 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 3 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 81.16 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041411**
 Date Sampled: **May 23, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **05/23/2019 RG_ERIMF-RSC-13-M_20190523**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 12 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.19 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.4 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 19 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.73 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041412**
Date Sampled: **May 23, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-14-M_20190523**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 20 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.07 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.19 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 4.1 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 6 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 180 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.98 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041413**
Date Sampled: **May 23, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/23/2019 RG_ERIMF-RSC-15-M_20190523**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 17 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 9 | 5 |
| Mercury | ug/g | 0.26 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.1 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 25 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 90 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.12 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041414** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 23, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/23/2019 RG_ERIMF-RSC-16-M_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.05 |
| Barium | ug/g | 15 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | 0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.8 | 0.5 |
| Iron | ug/g | 25 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 6.7 | 0.5 |
| Mercury | ug/g | 0.12 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.4 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 22 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 67 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.23 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041415**
Date Sampled: **May 24, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **05/24/2019 RG_ERWSF-RSC-01-M_20190524**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 1.5 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.9 | 0.5 |
| Iron | ug/g | 17 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 2.6 | 0.5 |
| Mercury | ug/g | 0.46 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 2.2 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.8 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 36 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.93 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041416** Client PO #: **VPO00616225 19-12**
 Date Sampled: **May 29, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.05G TO 50ML**
 Description: **05/29/2019 RG_ERWSF-RSC-02-M_20190529**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 0.9 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.2 | 0.5 |
| Iron | ug/g | 15 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.4 | 0.5 |
| Mercury | ug/g | 0.20 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 2.3 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.0 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 22 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 81.29 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041417**
Date Sampled: **May 30, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **05/30/2019 RG_ERWSF-RSC-03-M_20190530**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.26 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 2.2 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 82.92 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041418**
 Date Sampled: **Jun 13, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/13/2019 RG_ER_RSC_01-M_20190613**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.05 | 0.02 |
| Barium | ug/g | 0.63 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.1 | 0.1 |
| Cobalt | ug/g | 0.03 | 0.02 |
| Copper | ug/g | 1.4 | 0.1 |
| Iron | ug/g | 15 | 5 |
| Lead | ug/g | 0.02 | 0.02 |
| Manganese | ug/g | 1.1 | 0.2 |
| Mercury | ug/g | 0.72 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 1.7 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 55 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 78.42 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041419** Client PO #: **VPO00616225 19-12**
 Date Sampled: **Jun 13, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/13/2019 RG_ER_RSC_02-M_20190613**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.02 |
| Barium | ug/g | 0.82 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | 0.03 | 0.02 |
| Copper | ug/g | 1.8 | 0.1 |
| Iron | ug/g | 19 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.5 | 0.2 |
| Mercury | ug/g | 0.24 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 1.3 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 40 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.61 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041420** Client PO #: **VPO00616225 19-12**
Date Sampled: **Jun 21, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.2G TO 50ML**
Description: **06/21/2019 RG_ER_RSC_03-M_20190621**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.02 |
| Barium | ug/g | 1.2 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.5 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.8 | 0.1 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.3 | 0.2 |
| Mercury | ug/g | 0.30 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 3.3 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.3 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 61 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 80.76 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041421** Client PO #: **VPO00616225 19-12**
 Date Sampled: **Jun 22, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/22/2019 RG_ER_RSC_04-M_20190622**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.02 |
| Barium | ug/g | 0.95 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.2 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 2.3 | 0.1 |
| Iron | ug/g | 17 | 5 |
| Lead | ug/g | 0.02 | 0.02 |
| Manganese | ug/g | 1.1 | 0.2 |
| Mercury | ug/g | 0.34 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 3.0 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.0 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 78 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 79.07 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041422**
Date Sampled: **Jun 22, 2019**
Sample Matrix: **FDT 0.5G TO 50ML**
Description: **06/22/2019 RG_ER_RSC_05-M_20190622**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|-------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <2 | 2 |
| Antimony | ug/g | <0.01 | 0.01 |
| Arsenic | ug/g | 0.09 | 0.01 |
| Barium | ug/g | 0.68 | 0.02 |
| Beryllium | ug/g | <0.01 | 0.01 |
| Boron | ug/g | <1 | 1 |
| Cadmium | ug/g | <0.01 | 0.01 |
| Chromium | ug/g | 0.09 | 0.05 |
| Cobalt | ug/g | 0.01 | 0.01 |
| Copper | ug/g | 1.8 | 0.05 |
| Iron | ug/g | 19 | 2 |
| Lead | ug/g | <0.01 | 0.01 |
| Manganese | ug/g | 1.7 | 0.1 |
| Mercury | ug/g | 0.52 | 0.005 |
| Molybdenum | ug/g | <0.02 | 0.02 |
| Nickel | ug/g | <0.05 | 0.05 |
| Selenium | ug/g | 2.5 | 0.01 |
| Silver | ug/g | <0.01 | 0.01 |
| Strontium | ug/g | 3.6 | 0.05 |
| Thallium | ug/g | 0.011 | 0.005 |
| Tin | ug/g | <0.05 | 0.05 |
| Titanium | ug/g | <0.2 | 0.2 |
| Uranium | ug/g | <0.005 | 0.005 |
| Vanadium | ug/g | <0.1 | 0.1 |
| Zinc | ug/g | 64 | 0.5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 81.07 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041423**
 Date Sampled: **Jun 24, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/24/2019 RG_ER_RSC_06-M_20190624**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.16 | 0.02 |
| Barium | ug/g | 0.66 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.3 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.5 | 0.1 |
| Iron | ug/g | 13 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 0.9 | 0.2 |
| Mercury | ug/g | 0.28 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 1.9 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.2 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 53 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 79.12 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041424**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **FDT 0.2G TO 50ML**
Description: **06/24/2019 RG_ER_RSC_07-M_20190624**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.02 |
| Barium | ug/g | 0.52 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.2 | 0.1 |
| Cobalt | ug/g | 0.02 | 0.02 |
| Copper | ug/g | 1.1 | 0.1 |
| Iron | ug/g | 10 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 0.9 | 0.2 |
| Mercury | ug/g | 0.34 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 2.5 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.2 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 31 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.93 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041425** Client PO #: **VPO00616225 19-12**
 Date Sampled: **Jun 24, 2019** Date Received: **Jul 25, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/24/2019 RG_ER_RSC_08-M_20190624**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.04 | 0.02 |
| Barium | ug/g | 0.58 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.6 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.6 | 0.1 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.5 | 0.2 |
| Mercury | ug/g | 0.17 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 2.4 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 28 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 78.29 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041426** Client PO #: **VPO00616225 19-12**
Date Sampled: **Jun 22, 2019** Date Received: **Jul 25, 2019**
Sample Matrix: **FDT 0.2G TO 50ML**
Description: **06/22/2019 RG_ER_RSC_09-M_20190624**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.02 |
| Barium | ug/g | 0.84 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.8 | 0.1 |
| Iron | ug/g | 16 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.0 | 0.2 |
| Mercury | ug/g | 0.27 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 2.2 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.5 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 66 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.27 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041427**
 Date Sampled: **Jun 24, 2019**
 Sample Matrix: **FDT 0.2G TO 50ML**
 Description: **06/24/2019 RG_ER_RSC_010-M_20190624**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.02 |
| Barium | ug/g | 0.93 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.5 | 0.1 |
| Iron | ug/g | 14 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.2 | 0.2 |
| Mercury | ug/g | 0.30 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | 0.1 | 0.1 |
| Selenium | ug/g | 1.7 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.0 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 63 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 79.82 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041428**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **FDT 0.2G TO 50ML**
Description: **06/24/2019 RG_ER_RSC_11-M_20190624**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.02 |
| Barium | ug/g | 1.2 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | <0.02 | 0.02 |
| Copper | ug/g | 1.6 | 0.1 |
| Iron | ug/g | 14 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.2 | 0.2 |
| Mercury | ug/g | 0.34 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 1.9 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 2.2 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 76 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 80.65 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041429**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **FDT 0.5G TO 50ML**
Description: **06/24/2019 RG_ER_RSC_12-M_20190624**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|-------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <2 | 2 |
| Antimony | ug/g | <0.01 | 0.01 |
| Arsenic | ug/g | 0.06 | 0.01 |
| Barium | ug/g | 1.1 | 0.02 |
| Beryllium | ug/g | <0.01 | 0.01 |
| Boron | ug/g | <1 | 1 |
| Cadmium | ug/g | <0.01 | 0.01 |
| Chromium | ug/g | <0.05 | 0.05 |
| Cobalt | ug/g | <0.01 | 0.01 |
| Copper | ug/g | 1.6 | 0.05 |
| Iron | ug/g | 13 | 2 |
| Lead | ug/g | <0.01 | 0.01 |
| Manganese | ug/g | 1.3 | 0.1 |
| Mercury | ug/g | 0.20 | 0.005 |
| Molybdenum | ug/g | <0.02 | 0.02 |
| Nickel | ug/g | <0.05 | 0.05 |
| Selenium | ug/g | 2.8 | 0.01 |
| Silver | ug/g | <0.01 | 0.01 |
| Strontium | ug/g | 2.4 | 0.05 |
| Thallium | ug/g | 0.012 | 0.005 |
| Tin | ug/g | <0.05 | 0.05 |
| Titanium | ug/g | <0.2 | 0.2 |
| Uranium | ug/g | <0.005 | 0.005 |
| Vanadium | ug/g | <0.1 | 0.1 |
| Zinc | ug/g | 51 | 0.5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 80.51 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041430**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **FDT 0.2G TO 50ML**
Description: **06/24/2019 RG_ER_RSC_13-M_20190624**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 7 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.02 |
| Barium | ug/g | 0.86 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | 0.04 | 0.02 |
| Copper | ug/g | 1.8 | 0.1 |
| Iron | ug/g | 20 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 1.3 | 0.2 |
| Mercury | ug/g | 0.28 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 2.5 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.6 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 56 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.23 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041431**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **FDT 0.5G TO 50ML**
Description: **06/24/2019 RG_ER_RSC_14-M_20190624**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|-------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <2 | 2 |
| Antimony | ug/g | <0.01 | 0.01 |
| Arsenic | ug/g | 0.12 | 0.01 |
| Barium | ug/g | 0.63 | 0.02 |
| Beryllium | ug/g | <0.01 | 0.01 |
| Boron | ug/g | <1 | 1 |
| Cadmium | ug/g | <0.01 | 0.01 |
| Chromium | ug/g | <0.05 | 0.05 |
| Cobalt | ug/g | <0.01 | 0.01 |
| Copper | ug/g | 1.6 | 0.05 |
| Iron | ug/g | 13 | 2 |
| Lead | ug/g | <0.01 | 0.01 |
| Manganese | ug/g | 0.8 | 0.1 |
| Mercury | ug/g | 0.44 | 0.005 |
| Molybdenum | ug/g | <0.02 | 0.02 |
| Nickel | ug/g | <0.05 | 0.05 |
| Selenium | ug/g | 2.7 | 0.01 |
| Silver | ug/g | <0.01 | 0.01 |
| Strontium | ug/g | 1.2 | 0.05 |
| Thallium | ug/g | 0.016 | 0.005 |
| Tin | ug/g | <0.05 | 0.05 |
| Titanium | ug/g | <0.2 | 0.2 |
| Uranium | ug/g | <0.005 | 0.005 |
| Vanadium | ug/g | <0.1 | 0.1 |
| Zinc | ug/g | 55 | 0.5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 78.48 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041432**
Date Sampled: **Jun 04, 2019**
Sample Matrix: **FDT 0.005G TO 50ML**
Description: **06/04/2019 RG_STPD_RSC_14-M20190604**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.10 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.26 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 18 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.02 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041433**
Date Sampled: **Jun 04, 2019**
Sample Matrix: **FDT 0.05G TO 50ML**
Description: **06/04/2019 RG_STPD_RSC_15-M20190604**

Client PO #: **VPO00616225 19-12**
Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.25 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 1.8 | 0.5 |
| Iron | ug/g | 19 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 1.0 | 0.5 |
| Mercury | ug/g | 0.19 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 19 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1.6 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 31 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 78.49 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-10406

Aug 15, 2019

Teck Coal Limited

Sample #: **2019041434**
 Date Sampled: **Jun 04, 2019**
 Sample Matrix: **FDT 0.005G TO 50ML**
 Description: **06/04/2019 RG_STPD_RSC_16-M20190604**

Client PO #: **VPO00616225 19-12**
 Date Received: **Jul 25, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | <5 | 5 |
| Mercury | ug/g | 0.16 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 18 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 5 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | <50 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 82.45 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 7.3 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

| SampleID | Total Wet Weight of the Sample (g) |
|------------|------------------------------------|
| 2019041379 | 0.137 |
| 2019041380 | 0.077 |
| 2019041381 | 0.2621 |
| 2019041382 | 0.1697 |
| 2019041383 | 0.1327 |
| 2019041384 | 0.1369 |
| 2019041385 | 0.0806 |
| 2019041386 | 0.1444 |
| 2019041387 | 0.1183 |
| 2019041388 | 0.195 |
| 2019041389 | 0.1133 |
| 2019041390 | 0.1922 |
| 2019041391 | 0.2071 |
| 2019041392 | 0.1096 |
| 2019041393 | 0.0748 |
| 2019041394 | 0.1689 |
| 2019041395 | 0.0412 |
| 2019041396 | 0.0596 |
| 2019041397 | 0.0788 |
| 2019041398 | 0.0921 |
| 2019041399 | 0.08 |
| 2019041400 | 0.0701 |
| 2019041401 | 0.0953 |
| 2019041402 | 0.0861 |
| 2019041403 | 0.0727 |
| 2019041404 | 0.0829 |
| 2019041405 | 0.072 |
| 2019041406 | 0.0608 |
| 2019041407 | 0.1215 |
| 2019041408 | 0.0913 |
| 2019041409 | 0.0806 |
| 2019041410 | 0.0552 |
| 2019041411 | 0.0467 |
| 2019041412 | 0.0738 |
| 2019041413 | 0.0569 |
| 2019041414 | 0.109 |
| 2019041415 | 0.1471 |
| 2019041416 | 0.1288 |
| 2019041417 | 0.0878 |
| 2019041418 | 0.7117 |
| 2019041419 | 0.8021 |
| 2019041420 | 0.908 |

| | |
|------------|--------|
| 2019041421 | 1.0353 |
| 2019041422 | 1.2771 |
| 2019041423 | 0.577 |
| 2019041424 | 0.7567 |
| 2019041425 | 0.8552 |
| 2019041426 | 0.685 |
| 2019041427 | 0.816 |
| 2019041428 | 0.8253 |
| 2019041429 | 1.3378 |
| 2019041430 | 0.7985 |
| 2019041431 | 1.2448 |
| 2019041432 | 0.0909 |
| 2019041433 | 0.1153 |
| 2019041434 | 0.0735 |

Aug 14, 2019

This report was generated for samples included in SRC Group # 2019-10406

Quality Control Report

Cait Good
 Teck Coal Limited
 421 Pine Avenue
 Sparwood, BC V0B 2G0

Reference Materials and Standards:

A reference material of known concentration is used whenever possible as either a control sample or control standard and analyzed with each batch of samples. These "QC" results are used to assess the performance of the method and must be within clearly defined limits; otherwise corrective action is required.

| QC Analysis | Units | Target Value | Obtained Value | |
|-------------|-------|--------------|----------------|------|
| Aluminum | ug/g | 1280 | 1190 | |
| Aluminum | ug/g | 1280 | 1310 | |
| Arsenic | ug/g | 6.87 | 6.49 | |
| Arsenic | ug/g | 6.87 | 7.21 | |
| Cadmium | ug/g | 0.299 | 0.279 | |
| Cadmium | ug/g | 0.299 | 0.289 | |
| Chromium | ug/g | 1.57 | 1.48 | |
| Chromium | ug/g | 1.57 | 1.54 | |
| Copper | ug/g | 13.8 | 13.4 | |
| Copper | ug/g | 13.8 | 14.2 | |
| Iron | ug/g | 312 | 291 | |
| Iron | ug/g | 312 | 317 | |
| Lead | ug/g | 0.404 | 0.598 | *(1) |
| Lead | ug/g | 0.404 | 0.382 | |
| Manganese | ug/g | 2.70 | 2.53 | |
| Manganese | ug/g | 2.70 | 2.64 | |
| Mercury | ug/g | 0.364 | 0.307 | |
| Mercury | ug/g | 0.364 | 0.339 | |
| Nickel | ug/g | 1.20 | 1.13 | |
| Nickel | ug/g | 1.20 | 1.19 | |
| Selenium | ug/g | 3.45 | 3.37 | |
| Selenium | ug/g | 3.45 | 3.60 | |
| Silver | ug/g | 0.0234 | 0.0235 | |
| Silver | ug/g | 0.0234 | 0.0244 | |
| Zinc | ug/g | 47.8 | 42.7 | |
| Zinc | ug/g | 47.8 | 42.3 | |

*(1) The Lead result for the quality control sample was outside the laboratory's specified limits. The data was reviewed and samples could not be reanalyzed due to limited sample availability. Additional quality control measures in the same batch were within specified limits.

Aug 14, 2019

This report was generated for samples included in SRC Group # 2019-10406

Please note, duplicates could not be analyzed for ICP due to insufficient sample available.

Overall, there were no other indications of problems with the analysis and the results were considered acceptable.

Roxane Ortmann - Quality Assurance Supervisor

TrichAnalytics Muscle Analysis



TrichAnalytcs Inc.

Fish Muscle Tissue Microchemistry Analysis Report

Client:

Liz Ashby
Golder Associates Ltd.
Suite 200 - 2920 Virtual Way
Vancouver, BC, V5M 0C4
Ph: 604-296-2766
Email: Liz_Ashby@golder.com

Date Received:

08 Aug 2019

Final Report Date:

23 Aug 2019

Project No.

2019-071

Analytical Request: Fish Muscle Tissue Microchemistry (total metals and moisture) – 56 samples.

See chain of custody form provided for sample identification numbers.

Includes: LA-ICP-MS (line scans), data integration and calculations, QA/QC results, Excel data, chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalytcs Inc. method MET-002.02.
Four point analytical balance used to measure sample weights. Accuracy +/- 0.1 mg.
Analytical results are expressed in part per million (ppm) dry weight.
Samples quantified using DORM-4 certified reference standard.

This report provides the analytical results only for fish muscle tissue samples noted above as received from the Client.

Reviewed and Approved by Jennie Christensen, PhD, RPBio

23 Aug 2019

Date

[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalytcs Inc.]



TrichAnalytcs Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytcs.com

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41379 | 41380 | 41381 | 41382 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.1059 | 0.0833 | 0.1398 | 0.1484 |
| Moisture (%) | | 70.8 | 68.9 | 73.7 | 72.3 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.273 | 0.073 | 0.150 | 0.053 |
| 23Na | 2.79 | 1,987 | 906 | 1,353 | 1,488 |
| 24Mg | 0.047 | 1,618 | 1,158 | 1,600 | 1,589 |
| 27Al | 0.076 | 11.9 | 8.88 | 7.97 | 3.84 |
| 31P | 56.7 | 12,310 | 10,289 | 11,589 | 10,682 |
| 39K | 3.13 | 22,586 | 21,430 | 23,477 | 22,330 |
| 44Ca | 22.1 | 2,727 | 1,268 | 1,580 | 1,128 |
| 51V | 0.009 | 0.302 | 0.092 | 0.188 | 0.104 |
| 52Cr | 0.107 | 1.94 | 1.52 | 2.11 | 1.58 |
| 55Mn | 0.005 | 2.70 | 1.10 | 1.64 | 1.32 |
| 57Fe | 0.938 | 41.2 | 26.9 | 40.0 | 20.6 |
| 59Co | 0.008 | 0.247 | 0.081 | 0.152 | 0.085 |
| 60Ni | 0.009 | 1.39 | 0.457 | 1.27 | 0.536 |
| 63Cu | 0.004 | 3.41 | 2.17 | 3.16 | 2.31 |
| 66Zn | 0.063 | 55.1 | 44.2 | 64.0 | 55.2 |
| 75As | 0.044 | 0.211 | 0.061 | 0.199 | 0.079 |
| 77Se | 0.165 | 0.732 | 0.644 | 0.911 | 0.635 |
| 88Sr | 0.0004 | 2.51 | 0.721 | 1.01 | 0.696 |
| 95Mo | 0.003 | 0.218 | 0.054 | 0.131 | 0.045 |
| 111Cd | 0.014 | 0.586 | 0.386 | 0.620 | 0.445 |
| 118Sn | 0.009 | 0.261 | 0.251 | 0.349 | 0.157 |
| 202Hg | 0.028 | 0.544 | 0.293 | 0.547 | 0.917 |
| 208Pb | 0.001 | 0.331 | 0.068 | 0.157 | 0.095 |
| 238U | 0.0001 | 0.174 | 0.029 | 0.104 | 0.018 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41383 | 41384 | 41385 | 41386 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.1070 | 0.0975 | 0.0727 | 0.1460 |
| Moisture (%) | | 71.9 | 71.7 | 74.4 | 71.7 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.069 | 0.022 | 0.045 | 0.011 |
| 23Na | 2.79 | 1,544 | 1,042 | 993 | 696 |
| 24Mg | 0.047 | 1,508 | 1,533 | 1,473 | 1,587 |
| 27Al | 0.076 | 3.46 | 3.38 | 2.47 | 1.01 |
| 31P | 56.7 | 10,870 | 9,497 | 9,537 | 9,664 |
| 39K | 3.13 | 15,403 | 19,434 | 18,096 | 16,440 |
| 44Ca | 22.1 | 5,230 | 1,231 | 1,464 | 1,041 |
| 51V | 0.009 | 0.099 | 0.042 | 0.086 | 0.026 |
| 52Cr | 0.107 | 1.47 | 1.52 | 1.71 | 1.37 |
| 55Mn | 0.005 | 4.66 | 0.856 | 1.52 | 0.932 |
| 57Fe | 0.938 | 35.6 | 19.4 | 28.7 | 22.1 |
| 59Co | 0.008 | 0.077 | 0.050 | 0.081 | 0.023 |
| 60Ni | 0.009 | 0.543 | 0.644 | 0.802 | 0.273 |
| 63Cu | 0.004 | 2.79 | 2.11 | 3.36 | 1.61 |
| 66Zn | 0.063 | 68.7 | 31.9 | 67.3 | 50.5 |
| 75As | 0.044 | 0.137 | 0.118 | 0.118 | 0.061 |
| 77Se | 0.165 | 0.665 | 0.630 | 0.630 | 0.661 |
| 88Sr | 0.0004 | 5.51 | 0.577 | 1.10 | 0.579 |
| 95Mo | 0.003 | 0.034 | 0.016 | 0.057 | 0.012 |
| 111Cd | 0.014 | 0.629 | 0.255 | 0.621 | 0.393 |
| 118Sn | 0.009 | 0.151 | 0.055 | 0.116 | 0.038 |
| 202Hg | 0.028 | 1.17 | 0.525 | 0.505 | 0.575 |
| 208Pb | 0.001 | 0.113 | 0.026 | 0.084 | 0.028 |
| 238U | 0.0001 | 0.025 | 0.0029 | 0.020 | 0.0012 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41387 | 41388 | 41389 | 41390 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.0983 | 0.1593 | 0.0916 | 0.1894 |
| Moisture (%) | | 69.7 | 73.8 | 72.8 | 73.5 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.029 | 0.076 | 0.039 | 0.027 |
| 23Na | 2.79 | 823 | 1,385 | 853 | 1,031 |
| 24Mg | 0.047 | 1,487 | 1,485 | 1,489 | 1,412 |
| 27Al | 0.076 | 2.24 | 4.51 | 1.77 | 1.19 |
| 31P | 56.7 | 9,945 | 11,501 | 9,098 | 8,537 |
| 39K | 3.13 | 18,501 | 21,386 | 15,093 | 13,741 |
| 44Ca | 22.1 | 1,113 | 1,611 | 1,087 | 1,231 |
| 51V | 0.009 | 0.069 | 0.115 | 0.051 | 0.031 |
| 52Cr | 0.107 | 1.85 | 1.41 | 1.62 | 1.68 |
| 55Mn | 0.005 | 1.72 | 1.42 | 0.948 | 1.27 |
| 57Fe | 0.938 | 30.2 | 21.6 | 29.2 | 29.8 |
| 59Co | 0.008 | 0.089 | 0.083 | 0.070 | 0.041 |
| 60Ni | 0.009 | 1.06 | 0.421 | 0.663 | 0.777 |
| 63Cu | 0.004 | 2.91 | 1.68 | 2.70 | 2.11 |
| 66Zn | 0.063 | 60.8 | 54.3 | 57.0 | 48.7 |
| 75As | 0.044 | 0.115 | 0.165 | 0.097 | <0.044 |
| 77Se | 0.165 | 0.602 | 0.860 | 12.9 | 16.1 |
| 88Sr | 0.0004 | 0.751 | 1.26 | 0.950 | 0.965 |
| 95Mo | 0.003 | 0.035 | 0.054 | 0.035 | 0.012 |
| 111Cd | 0.014 | 0.544 | 0.571 | 0.503 | 0.399 |
| 118Sn | 0.009 | 0.166 | 0.151 | 0.117 | 0.020 |
| 202Hg | 0.028 | 0.369 | 0.536 | 0.351 | 0.334 |
| 208Pb | 0.001 | 0.064 | 0.125 | 0.056 | 0.011 |
| 238U | 0.0001 | 0.0148 | 0.0320 | 0.0081 | 0.0012 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41391 | 41392 | 41393 | 41394 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.1529 | 0.1349 | 0.0518 | 0.1653 |
| Moisture (%) | | 71.4 | 75.0 | 68.3 | 74.3 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.052 | 0.035 | 0.041 | 0.054 |
| 23Na | 2.79 | 1,299 | 1,177 | 1,138 | 1,254 |
| 24Mg | 0.047 | 1,525 | 1,342 | 1,420 | 1,679 |
| 27Al | 0.076 | 1.23 | 1.83 | 1.95 | 4.31 |
| 31P | 56.7 | 9,999 | 8,325 | 8,200 | 9,408 |
| 39K | 3.13 | 13,167 | 12,706 | 12,790 | 15,429 |
| 44Ca | 22.1 | 4,897 | 1,221 | 1,110 | 1,558 |
| 51V | 0.009 | 0.036 | 0.051 | 0.043 | 0.059 |
| 52Cr | 0.107 | 2.17 | 1.29 | 1.47 | 1.69 |
| 55Mn | 0.005 | 2.49 | 1.20 | 0.871 | 1.00 |
| 57Fe | 0.938 | 48.1 | 19.7 | 18.4 | 28.5 |
| 59Co | 0.008 | 0.068 | 0.050 | 0.034 | 0.078 |
| 60Ni | 0.009 | 1.46 | 0.370 | 0.534 | 0.428 |
| 63Cu | 0.004 | 1.43 | 1.39 | 2.06 | 1.90 |
| 66Zn | 0.063 | 45.8 | 48.1 | 21.9 | 46.5 |
| 75As | 0.044 | 0.089 | 0.053 | 0.045 | 0.118 |
| 77Se | 0.165 | 18.1 | 14.3 | 16.1 | 17.3 |
| 88Sr | 0.0004 | 5.65 | 0.985 | 0.740 | 1.15 |
| 95Mo | 0.003 | 0.020 | 0.028 | 0.020 | 0.039 |
| 111Cd | 0.014 | 0.338 | 0.422 | 0.211 | 0.407 |
| 118Sn | 0.009 | 0.096 | 0.058 | 0.058 | 0.074 |
| 202Hg | 0.028 | 0.323 | 0.399 | 0.319 | 0.282 |
| 208Pb | 0.001 | 0.010 | 0.030 | 0.024 | 0.073 |
| 238U | 0.0001 | 0.0012 | 0.0041 | 0.0020 | 0.0058 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41395 | 41396 | 41397 | 41398 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.0425 | 0.0507 | 0.0674 | 0.0709 |
| Moisture (%) | | 69.9 | 66.1 | 73.4 | 70.4 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.031 | 0.014 | 0.035 | 0.037 |
| 23Na | 2.79 | 947 | 867 | 1,891 | 1,685 |
| 24Mg | 0.047 | 1,224 | 1,148 | 1,969 | 1,777 |
| 27Al | 0.076 | 3.08 | 1.67 | 3.19 | 2.52 |
| 31P | 56.7 | 7,641 | 9,378 | 13,375 | 13,921 |
| 39K | 3.13 | 13,351 | 18,583 | 24,944 | 24,370 |
| 44Ca | 22.1 | 1,028 | 988 | 1,840 | 1,870 |
| 51V | 0.009 | 0.027 | 0.023 | 0.051 | 0.036 |
| 52Cr | 0.107 | 1.25 | 1.51 | 1.92 | 1.97 |
| 55Mn | 0.005 | 0.577 | 0.711 | 2.05 | 1.49 |
| 57Fe | 0.938 | 19.5 | 17.5 | 29.3 | 23.7 |
| 59Co | 0.008 | 0.022 | 0.026 | 0.046 | 0.050 |
| 60Ni | 0.009 | 0.411 | 0.730 | 0.914 | 0.806 |
| 63Cu | 0.004 | 1.28 | 1.13 | 1.32 | 1.86 |
| 66Zn | 0.063 | 35.5 | 25.0 | 36.2 | 51.6 |
| 75As | 0.044 | <0.044 | <0.044 | <0.044 | 0.052 |
| 77Se | 0.165 | 15.0 | 15.6 | 22.5 | 19.0 |
| 88Sr | 0.0004 | 0.673 | 0.613 | 1.19 | 1.29 |
| 95Mo | 0.003 | 0.012 | 0.009 | 0.016 | 0.016 |
| 111Cd | 0.014 | 0.316 | 0.200 | 0.305 | 0.378 |
| 118Sn | 0.009 | 0.137 | 0.025 | 0.390 | 0.060 |
| 202Hg | 0.028 | 0.296 | 0.219 | 0.310 | 0.398 |
| 208Pb | 0.001 | 0.016 | 0.013 | 0.050 | 0.023 |
| 238U | 0.0001 | 0.0006 | 0.0003 | 0.0032 | 0.0024 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41399 | 41400 | 41401 | 41402 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.0577 | 0.0472 | 0.0713 | 0.0953 |
| Moisture (%) | | 71.4 | 74.2 | 70.8 | 71.1 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.028 | 0.026 | 0.040 | 0.023 |
| 23Na | 2.79 | 1,051 | 1,322 | 1,687 | 1,356 |
| 24Mg | 0.047 | 1,637 | 2,304 | 2,071 | 1,660 |
| 27Al | 0.076 | 4.47 | 5.38 | 4.96 | 2.80 |
| 31P | 56.7 | 10,561 | 11,908 | 12,346 | 10,701 |
| 39K | 3.13 | 18,825 | 22,549 | 23,348 | 18,805 |
| 44Ca | 22.1 | 1,658 | 1,565 | 1,646 | 1,266 |
| 51V | 0.009 | 0.056 | 0.043 | 0.067 | 0.035 |
| 52Cr | 0.107 | 1.85 | 2.58 | 3.22 | 1.46 |
| 55Mn | 0.005 | 1.17 | 1.27 | 2.08 | 1.08 |
| 57Fe | 0.938 | 25.2 | 34.2 | 50.7 | 25.6 |
| 59Co | 0.008 | 0.055 | 0.075 | 0.134 | 0.044 |
| 60Ni | 0.009 | 1.37 | 2.04 | 3.32 | 0.372 |
| 63Cu | 0.004 | 1.69 | 1.21 | 1.67 | 1.86 |
| 66Zn | 0.063 | 28.2 | 20.9 | 29.9 | 48.7 |
| 75As | 0.044 | 0.063 | 0.048 | <0.044 | 0.066 |
| 77Se | 0.165 | 19.9 | 20.8 | 19.9 | 2.79 |
| 88Sr | 0.0004 | 0.948 | 0.993 | 2.93 | 0.848 |
| 95Mo | 0.003 | 0.024 | 0.015 | 0.014 | 0.024 |
| 111Cd | 0.014 | 0.230 | 0.142 | 0.180 | 0.326 |
| 118Sn | 0.009 | 0.164 | 0.232 | 0.092 | 0.121 |
| 202Hg | 0.028 | 0.333 | 0.378 | 0.416 | 0.618 |
| 208Pb | 0.001 | 0.057 | 0.040 | 0.024 | 0.023 |
| 238U | 0.0001 | 0.0028 | 0.0008 | 0.0008 | 0.0008 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41403 | 41404 | 41405 | 41406 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.0547 | 0.0473 | 0.0750 | 0.0627 |
| Moisture (%) | | 69.7 | 71.7 | 73.9 | 70.3 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.035 | 0.037 | 0.015 | 0.031 |
| 23Na | 2.79 | 2,287 | 2,160 | 1,406 | 2,121 |
| 24Mg | 0.047 | 1,692 | 2,198 | 1,767 | 2,116 |
| 27Al | 0.076 | 4.04 | 4.06 | 2.03 | 2.70 |
| 31P | 56.7 | 11,204 | 14,467 | 12,203 | 12,720 |
| 39K | 3.13 | 15,299 | 28,092 | 24,492 | 21,979 |
| 44Ca | 22.1 | 1,675 | 1,886 | 1,401 | 2,379 |
| 51V | 0.009 | 0.047 | 0.068 | 0.034 | 0.053 |
| 52Cr | 0.107 | 1.89 | 1.90 | 1.60 | 1.82 |
| 55Mn | 0.005 | 1.94 | 1.74 | 0.633 | 1.67 |
| 57Fe | 0.938 | 28.3 | 34.9 | 25.7 | 55.2 |
| 59Co | 0.008 | 0.078 | 0.073 | 0.039 | 0.080 |
| 60Ni | 0.009 | 1.47 | 0.904 | 0.576 | 0.904 |
| 63Cu | 0.004 | 1.51 | 3.63 | 1.98 | 3.68 |
| 66Zn | 0.063 | 66.5 | 93.2 | 26.0 | 52.1 |
| 75As | 0.044 | <0.044 | 0.085 | 0.058 | 0.088 |
| 77Se | 0.165 | 2.20 | 1.80 | 1.44 | 3.64 |
| 88Sr | 0.0004 | 1.56 | 1.28 | 0.900 | 2.18 |
| 95Mo | 0.003 | 0.020 | 0.031 | 0.020 | 0.035 |
| 111Cd | 0.014 | 0.534 | 0.647 | 0.166 | 0.342 |
| 118Sn | 0.009 | 0.085 | 0.340 | 0.082 | 0.077 |
| 202Hg | 0.028 | 0.509 | 0.347 | 0.692 | 0.801 |
| 208Pb | 0.001 | 0.062 | 0.070 | 0.019 | 0.055 |
| 238U | 0.0001 | 0.0055 | 0.0067 | 0.0012 | 0.0043 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41407 | 41408 | 41409 | 41410 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.1027 | 0.0892 | 0.0511 | 0.0411 |
| Moisture (%) | | 72.0 | 72.4 | 68.3 | 75.4 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.018 | 0.024 | 0.013 | 0.037 |
| 23Na | 2.79 | 1,723 | 1,603 | 1,550 | 2,012 |
| 24Mg | 0.047 | 1,960 | 1,388 | 1,537 | 1,688 |
| 27Al | 0.076 | 2.28 | 4.29 | 1.50 | 5.14 |
| 31P | 56.7 | 11,969 | 10,371 | 13,430 | 14,594 |
| 39K | 3.13 | 21,565 | 14,892 | 26,295 | 28,172 |
| 44Ca | 22.1 | 1,238 | 2,646 | 1,429 | 1,980 |
| 51V | 0.009 | 0.040 | 0.035 | 0.026 | 0.051 |
| 52Cr | 0.107 | 1.97 | 1.81 | 1.82 | 2.18 |
| 55Mn | 0.005 | 1.05 | 1.41 | 1.04 | 1.63 |
| 57Fe | 0.938 | 29.2 | 32.5 | 25.5 | 47.6 |
| 59Co | 0.008 | 0.071 | 0.052 | 0.039 | 0.087 |
| 60Ni | 0.009 | 1.37 | 1.07 | 1.00 | 1.34 |
| 63Cu | 0.004 | 1.52 | 1.55 | 1.43 | 2.09 |
| 66Zn | 0.063 | 44.8 | 42.3 | 60.4 | 69.1 |
| 75As | 0.044 | 0.089 | 0.074 | 0.047 | 0.069 |
| 77Se | 0.165 | 1.68 | 2.11 | 2.33 | 2.65 |
| 88Sr | 0.0004 | 0.845 | 2.34 | 0.854 | 1.66 |
| 95Mo | 0.003 | 0.014 | 0.019 | 0.015 | 0.023 |
| 111Cd | 0.014 | 0.286 | 0.240 | 0.341 | 0.379 |
| 118Sn | 0.009 | 0.084 | 0.059 | 0.038 | 0.236 |
| 202Hg | 0.028 | 0.564 | 0.519 | 0.520 | 0.562 |
| 208Pb | 0.001 | 0.020 | 0.024 | 0.010 | 0.051 |
| 238U | 0.0001 | 0.0008 | 0.0016 | 0.0004 | 0.0016 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41411 | 41412 | 41413 | 41414 |
|----------------|----------|--------|---------|--------|--------|
| Wet Weight (g) | | 0.0315 | 0.0847 | 0.0439 | 0.1084 |
| Moisture (%) | | 66.7 | 71.9 | 70.2 | 73.3 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.026 | 0.052 | 0.022 | 0.029 |
| 23Na | 2.79 | 1,744 | 2,000 | 1,767 | 1,897 |
| 24Mg | 0.047 | 2,002 | 2,100 | 2,103 | 1,887 |
| 27Al | 0.076 | 1.73 | 3.82 | 3.01 | 2.49 |
| 31P | 56.7 | 14,825 | 13,951 | 12,714 | 12,835 |
| 39K | 3.13 | 25,477 | 19,823 | 20,015 | 22,252 |
| 44Ca | 22.1 | 3,295 | 2,981 | 2,044 | 2,120 |
| 51V | 0.009 | 0.047 | 0.042 | 0.027 | 0.044 |
| 52Cr | 0.107 | 2.03 | 1.72 | 2.13 | 1.83 |
| 55Mn | 0.005 | 1.34 | 2.35 | 1.18 | 1.13 |
| 57Fe | 0.938 | 49.1 | 58.6 | 35.1 | 41.8 |
| 59Co | 0.008 | 0.082 | 0.168 | 0.106 | 0.185 |
| 60Ni | 0.009 | 1.04 | 0.73 | 1.27 | 0.88 |
| 63Cu | 0.004 | 3.27 | 3.46 | 2.16 | 2.82 |
| 66Zn | 0.063 | 56.1 | 106 | 67.9 | 60.9 |
| 75As | 0.044 | 0.075 | 0.082 | 0.059 | 0.083 |
| 77Se | 0.165 | 2.24 | 4.55 | 1.66 | 1.90 |
| 88Sr | 0.0004 | 3.07 | 3.21 | 1.43 | 1.66 |
| 95Mo | 0.003 | 0.018 | 0.041 | 0.018 | 0.028 |
| 111Cd | 0.014 | 0.316 | 0.650 | 0.348 | 0.374 |
| 118Sn | 0.009 | 0.072 | 0.049 | 0.023 | 0.095 |
| 202Hg | 0.028 | 0.342 | 0.419 | 0.473 | 0.235 |
| 208Pb | 0.001 | 0.029 | 0.011 | 0.011 | 0.021 |
| 238U | 0.0001 | 0.0008 | <0.0001 | 0.0008 | 0.0012 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41415 | 41416 | 41417 | 41418 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.1521 | 0.1496 | 0.0850 | 0.6181 |
| Moisture (%) | | 74.3 | 76.7 | 75.1 | 77.3 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.017 | 0.014 | 0.009 | 0.011 |
| 23Na | 2.79 | 1,528 | 1,545 | 995 | 1,350 |
| 24Mg | 0.047 | 2,626 | 1,878 | 1,601 | 1,747 |
| 27Al | 0.076 | 2.07 | 2.68 | 3.04 | 2.47 |
| 31P | 56.7 | 16,692 | 14,201 | 11,199 | 15,027 |
| 39K | 3.13 | 26,227 | 27,366 | 22,261 | 28,010 |
| 44Ca | 22.1 | 2,560 | 1,579 | 1,288 | 1,423 |
| 51V | 0.009 | 0.023 | 0.045 | 0.021 | 0.022 |
| 52Cr | 0.107 | 1.74 | 1.67 | 1.44 | 1.46 |
| 55Mn | 0.005 | 1.60 | 1.01 | 0.815 | 1.13 |
| 57Fe | 0.938 | 37.8 | 22.8 | 19.7 | 27.4 |
| 59Co | 0.008 | 0.044 | 0.029 | 0.025 | 0.026 |
| 60Ni | 0.009 | 0.480 | 0.516 | 0.370 | 0.200 |
| 63Cu | 0.004 | 3.19 | 1.52 | 1.61 | 1.99 |
| 66Zn | 0.063 | 51.3 | 23.5 | 26.1 | 57.3 |
| 75As | 0.044 | <0.044 | <0.044 | <0.044 | 0.066 |
| 77Se | 0.165 | 3.28 | 3.15 | 2.52 | 1.93 |
| 88Sr | 0.0004 | 1.37 | 0.476 | 0.326 | 0.943 |
| 95Mo | 0.003 | 0.024 | 0.015 | 0.006 | 0.010 |
| 111Cd | 0.014 | 0.248 | 0.174 | 0.204 | 0.429 |
| 118Sn | 0.009 | 0.152 | 0.090 | 0.050 | 0.129 |
| 202Hg | 0.028 | 0.896 | 0.426 | 0.432 | 1.26 |
| 208Pb | 0.001 | 0.034 | 0.014 | 0.014 | 0.025 |
| 238U | 0.0001 | 0.0036 | 0.0009 | 0.0003 | 0.0006 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41419 | 41420 | 41421 | 41422 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.9077 | 0.6599 | 0.8228 | 1.2785 |
| Moisture (%) | | 76.6 | 79.0 | 77.4 | 79.2 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.017 | 0.016 | 0.024 | 0.020 |
| 23Na | 2.79 | 1,236 | 604 | 1,288 | 1,748 |
| 24Mg | 0.047 | 1,595 | 1,876 | 1,928 | 1,108 |
| 27Al | 0.076 | 1.93 | 1.75 | 3.00 | 1.56 |
| 31P | 56.7 | 14,151 | 11,927 | 12,611 | 11,988 |
| 39K | 3.13 | 27,463 | 22,549 | 23,409 | 24,475 |
| 44Ca | 22.1 | 1,433 | 1,359 | 1,372 | 1,254 |
| 51V | 0.009 | 0.024 | 0.025 | 0.039 | 0.033 |
| 52Cr | 0.107 | 1.36 | 1.53 | 1.37 | 1.26 |
| 55Mn | 0.005 | 1.03 | 1.03 | 1.39 | 1.15 |
| 57Fe | 0.938 | 22.8 | 23.2 | 24.8 | 25.9 |
| 59Co | 0.008 | 0.015 | 0.019 | 0.024 | 0.021 |
| 60Ni | 0.009 | 0.110 | 0.161 | 0.144 | 0.151 |
| 63Cu | 0.004 | 2.43 | 2.74 | 2.42 | 1.65 |
| 66Zn | 0.063 | 43.6 | 70.4 | 73.3 | 50.2 |
| 75As | 0.044 | 0.084 | 0.068 | 0.090 | 0.056 |
| 77Se | 0.165 | 1.69 | 3.68 | 3.20 | 2.43 |
| 88Sr | 0.0004 | 0.716 | 1.05 | 0.790 | 0.776 |
| 95Mo | 0.003 | 0.009 | 0.015 | 0.015 | 0.014 |
| 111Cd | 0.014 | 0.315 | 0.513 | 0.587 | 0.432 |
| 118Sn | 0.009 | 0.058 | 0.062 | 0.168 | 0.067 |
| 202Hg | 0.028 | 0.428 | 0.568 | 0.599 | 0.753 |
| 208Pb | 0.001 | 0.013 | 0.015 | 0.043 | 0.019 |
| 238U | 0.0001 | 0.0006 | 0.0009 | 0.0012 | 0.0009 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41423 | 41424 | 41425 | 41426 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.4864 | 0.5747 | 0.7085 | 0.6855 |
| Moisture (%) | | 77.3 | 77.3 | 76.5 | 75.5 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.017 | 0.023 | 0.012 | 0.015 |
| 23Na | 2.79 | 1,571 | 1,803 | 1,558 | 1,765 |
| 24Mg | 0.047 | 1,840 | 1,740 | 1,286 | 1,801 |
| 27Al | 0.076 | 1.12 | 3.14 | 1.71 | 1.14 |
| 31P | 56.7 | 11,581 | 14,250 | 11,345 | 12,945 |
| 39K | 3.13 | 23,790 | 28,246 | 23,585 | 26,024 |
| 44Ca | 22.1 | 1,425 | 1,520 | 1,218 | 1,500 |
| 51V | 0.009 | 0.02 | 0.033 | 0.025 | 0.011 |
| 52Cr | 0.107 | 1.43 | 1.53 | 1.32 | 1.44 |
| 55Mn | 0.005 | 0.947 | 1.23 | 1.02 | 0.915 |
| 57Fe | 0.938 | 23.5 | 21.5 | 17.9 | 22.7 |
| 59Co | 0.008 | 0.022 | 0.030 | 0.017 | 0.019 |
| 60Ni | 0.009 | 0.231 | 0.318 | 0.167 | 0.123 |
| 63Cu | 0.004 | 2.74 | 1.92 | 1.90 | 2.17 |
| 66Zn | 0.063 | 69.3 | 43.9 | 27.1 | 64.0 |
| 75As | 0.044 | 0.105 | 0.120 | 0.047 | 0.092 |
| 77Se | 0.165 | 2.23 | 3.46 | 2.70 | 2.78 |
| 88Sr | 0.0004 | 0.934 | 1.00 | 0.67 | 0.805 |
| 95Mo | 0.003 | 0.013 | 0.017 | 0.009 | 0.008 |
| 111Cd | 0.014 | 0.457 | 0.315 | 0.201 | 0.358 |
| 118Sn | 0.009 | 0.116 | 0.173 | 0.105 | 0.052 |
| 202Hg | 0.028 | 0.563 | 0.595 | 0.275 | 0.516 |
| 208Pb | 0.001 | 0.020 | 0.028 | 0.018 | 0.009 |
| 238U | 0.0001 | 0.0006 | 0.0021 | 0.0006 | 0.0006 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41427 | 41428 | 41429 | 41430 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 0.8215 | 0.5986 | 1.0214 | 0.7133 |
| Moisture (%) | | 77.8 | 77.6 | 78.6 | 75.9 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.015 | 0.019 | 0.012 | 0.018 |
| 23Na | 2.79 | 1,570 | 1,578 | 962 | 1,259 |
| 24Mg | 0.047 | 1,283 | 1,424 | 1,381 | 1,504 |
| 27Al | 0.076 | 1.14 | 1.13 | 1.30 | 1.62 |
| 31P | 56.7 | 11,370 | 10,838 | 9,882 | 10,942 |
| 39K | 3.13 | 22,925 | 21,215 | 17,886 | 19,189 |
| 44Ca | 22.1 | 1,143 | 1,153 | 967 | 1,308 |
| 51V | 0.009 | 0.024 | 0.024 | 0.023 | 0.036 |
| 52Cr | 0.107 | 1.28 | 1.29 | 1.26 | 1.33 |
| 55Mn | 0.005 | 1.00 | 0.829 | 0.939 | 1.09 |
| 57Fe | 0.938 | 19.2 | 20.4 | 19.3 | 16.3 |
| 59Co | 0.008 | 0.020 | 0.022 | 0.018 | 0.020 |
| 60Ni | 0.009 | 0.217 | 0.196 | 0.120 | 0.160 |
| 63Cu | 0.004 | 1.76 | 2.02 | 2.23 | 1.73 |
| 66Zn | 0.063 | 53.5 | 85.2 | 53.3 | 50.6 |
| 75As | 0.044 | 0.063 | 0.092 | 0.059 | 0.104 |
| 77Se | 0.165 | 1.92 | 2.18 | 3.07 | 2.89 |
| 88Sr | 0.0004 | 0.619 | 0.716 | 0.612 | 0.871 |
| 95Mo | 0.003 | 0.014 | 0.013 | 0.009 | 0.012 |
| 111Cd | 0.014 | 0.410 | 0.580 | 0.431 | 0.419 |
| 118Sn | 0.009 | 0.112 | 0.100 | 0.128 | 0.094 |
| 202Hg | 0.028 | 0.471 | 0.574 | 0.368 | 0.478 |
| 208Pb | 0.001 | 0.017 | 0.016 | 0.018 | 0.019 |
| 238U | 0.0001 | 0.0003 | 0.0009 | 0.0009 | 0.0012 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue Analysis

| Sample ID | | 41431 | 41432 | 41433 | 41434 |
|----------------|----------|--------|--------|--------|--------|
| Wet Weight (g) | | 1.3220 | 0.0750 | 0.1014 | 0.0739 |
| Moisture (%) | | 76.0 | 70.3 | 77.1 | 74.2 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.012 | 0.034 | 0.030 | 0.034 |
| 23Na | 2.79 | 1,269 | 1,369 | 966 | 1,345 |
| 24Mg | 0.047 | 1,461 | 1,463 | 1,339 | 1,548 |
| 27Al | 0.076 | 0.687 | 1.13 | 1.27 | 3.10 |
| 31P | 56.7 | 11,744 | 9,948 | 10,850 | 9,439 |
| 39K | 3.13 | 22,192 | 16,332 | 20,267 | 17,140 |
| 44Ca | 22.1 | 1,212 | 1,399 | 1,056 | 1,229 |
| 51V | 0.009 | 0.018 | 0.013 | 0.020 | 0.030 |
| 52Cr | 0.107 | 1.33 | 1.25 | 1.26 | 1.42 |
| 55Mn | 0.005 | 0.879 | 0.866 | 0.584 | 0.793 |
| 57Fe | 0.938 | 18.6 | 20.5 | 15.2 | 26.4 |
| 59Co | 0.008 | 0.015 | 0.021 | 0.021 | 0.048 |
| 60Ni | 0.009 | 0.074 | 0.180 | 0.246 | 1.52 |
| 63Cu | 0.004 | 2.11 | 1.60 | 1.40 | 2.79 |
| 66Zn | 0.063 | 57.1 | 35.9 | 22.7 | 46.0 |
| 75As | 0.044 | 0.094 | <0.044 | 0.087 | <0.044 |
| 77Se | 0.165 | 2.86 | 18.0 | 17.3 | 18.7 |
| 88Sr | 0.0004 | 0.669 | 1.02 | 0.513 | 0.780 |
| 95Mo | 0.003 | 0.007 | 0.008 | 0.009 | 0.013 |
| 111Cd | 0.014 | 0.414 | 0.306 | 0.180 | 0.321 |
| 118Sn | 0.009 | 0.058 | 0.029 | 0.058 | 0.076 |
| 202Hg | 0.028 | 0.737 | 0.337 | 0.247 | 0.268 |
| 208Pb | 0.001 | 0.010 | 0.006 | 0.013 | 0.011 |
| 238U | 0.0001 | 0.0003 | 0.0003 | 0.0006 | 0.0012 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Golder Associates Ltd. - Fish Muscle Tissue QA/QC Relative Percent Difference Results

| Sample ID | | 41382 | 41382 (Duplicate) | RPD | 41412 | 41412 (Duplicate) | RPD |
|-----------|----------|--------|-------------------|------|---------|-------------------|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.004 | 0.053 | 0.039 | - | 0.052 | 0.051 | - |
| 23Na | 2.79 | 1,488 | 1,115 | 28.7 | 2,000 | 1,687 | 17.0 |
| 24Mg | 0.047 | 1,589 | 1,460 | 8.4 | 2,100 | 1,818 | 14.4 |
| 27Al | 0.076 | 3.84 | 3.90 | 1.5 | 3.82 | 4.00 | 4.5 |
| 31P | 56.7 | 10,682 | 8,596 | 21.6 | 13,951 | 11,569 | 18.7 |
| 39K | 3.13 | 22,330 | 17,037 | 26.9 | 19,823 | 16,666 | 17.3 |
| 44Ca | 22.1 | 1,128 | 1,021 | 10.0 | 2,981 | 3,039 | 1.9 |
| 51V | 0.009 | 0.104 | 0.062 | - | 0.042 | 0.040 | - |
| 52Cr | 0.107 | 1.58 | 1.54 | - | 1.72 | 1.64 | - |
| 55Mn | 0.005 | 1.32 | 1.17 | 12.4 | 2.35 | 2.48 | 5.6 |
| 57Fe | 0.938 | 20.6 | 23.7 | 14.1 | 58.6 | 55.4 | 5.6 |
| 59Co | 0.008 | 0.085 | 0.073 | - | 0.168 | 0.166 | 1.1 |
| 60Ni | 0.009 | 0.536 | 0.621 | 14.7 | 0.734 | 0.861 | 16.0 |
| 63Cu | 0.004 | 2.31 | 2.39 | 3.6 | 3.46 | 3.05 | 12.5 |
| 66Zn | 0.063 | 55.2 | 52.7 | 4.6 | 106 | 92.2 | 13.7 |
| 75As | 0.044 | 0.079 | 0.081 | - | 0.082 | 0.088 | - |
| 77Se | 0.165 | 0.635 | 0.592 | - | 4.55 | 4.06 | 11.5 |
| 88Sr | 0.0004 | 0.696 | 0.620 | 11.6 | 3.21 | 2.80 | 13.5 |
| 95Mo | 0.003 | 0.045 | 0.031 | - | 0.041 | 0.045 | - |
| 111Cd | 0.014 | 0.445 | 0.416 | 6.8 | 0.650 | 0.607 | 6.9 |
| 118Sn | 0.009 | 0.157 | 0.073 | - | 0.049 | 0.036 | - |
| 202Hg | 0.028 | 0.917 | 0.829 | 10.1 | 0.419 | 0.331 | 23.2 |
| 208Pb | 0.001 | 0.095 | 0.064 | 39.2 | 0.011 | 0.011 | - |
| 238U | 0.00010 | 0.018 | 0.014 | 28.8 | <0.0001 | 0.0032 | - |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Data Quality Objectives:

Laboratory Duplicates - RPD \leq 40% for all elements (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016).
 Only applies to QC samples at concentrations above 20X Detection Limit

Golder Associates Ltd. - Fish Muscle Tissue QA/QC Relative Percent Difference Results

| Sample ID | | 41418 | 41418 (Duplicate) | RPD | 41427 | 41427 (Duplicate) | RPD |
|-----------|----------|--------|-------------------|------|--------|-------------------|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.004 | 0.011 | 0.014 | - | 0.015 | 0.016 | - |
| 23Na | 2.79 | 1,350 | 1,159 | 15.2 | 1,570 | 1,160 | 30.0 |
| 24Mg | 0.047 | 1,747 | 1,508 | 14.6 | 1,283 | 1,108 | 14.7 |
| 27Al | 0.076 | 2.47 | 2.30 | - | 1.14 | 1.45 | - |
| 31P | 56.7 | 15,027 | 12,391 | 19.2 | 11,370 | 8,699 | 26.6 |
| 39K | 3.13 | 28,010 | 24,921 | 11.7 | 22,925 | 16,456 | 32.9 |
| 44Ca | 22.1 | 1,423 | 1,413 | 0.7 | 1,143 | 1,016 | 11.8 |
| 51V | 0.009 | 0.022 | 0.022 | - | 0.024 | 0.022 | - |
| 52Cr | 0.107 | 1.46 | 1.43 | - | 1.28 | 1.11 | - |
| 55Mn | 0.005 | 1.13 | 1.01 | 10.4 | 1.00 | 0.85 | 16.4 |
| 57Fe | 0.938 | 27.4 | 27.9 | 2.0 | 19.2 | 15.6 | - |
| 59Co | 0.008 | 0.026 | 0.030 | - | 0.020 | 0.019 | - |
| 60Ni | 0.009 | 0.200 | 0.218 | 8.5 | 0.217 | 0.202 | 6.8 |
| 63Cu | 0.004 | 1.99 | 2.01 | 1.1 | 1.76 | 1.31 | 29.4 |
| 66Zn | 0.063 | 57.3 | 58.0 | 1.2 | 53.5 | 43.2 | 21.3 |
| 75As | 0.044 | 0.066 | 0.054 | - | 0.063 | 0.059 | - |
| 77Se | 0.165 | 1.93 | 2.07 | - | 1.92 | 1.58 | - |
| 88Sr | 0.0004 | 0.943 | 0.878 | 7.1 | 0.619 | 0.690 | 10.9 |
| 95Mo | 0.003 | 0.010 | 0.009 | - | 0.014 | 0.008 | - |
| 111Cd | 0.014 | 0.429 | 0.421 | 1.9 | 0.410 | 0.372 | 9.5 |
| 118Sn | 0.009 | 0.129 | 0.092 | - | 0.112 | 0.097 | - |
| 202Hg | 0.028 | 1.26 | 1.31 | 3.8 | 0.471 | 0.406 | - |
| 208Pb | 0.001 | 0.025 | 0.021 | 17.4 | 0.017 | 0.016 | - |
| 238U | 0.00010 | 0.0006 | 0.0003 | - | 0.0003 | 0.0009 | - |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Data Quality Objectives:

Laboratory Duplicates - RPD \leq 40% for all elements (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016).
 Only applies to QC samples at concentrations above 20X Detection Limit

Golder Associates Ltd. - Fish Muscle Tissue QA/QC Accuracy and Precision Results

| Parameter | Detection Limit (ppm) | Certified Value DORM-4 Conc. (ppm) | Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
|-----------|-----------------------|------------------------------------|----------------------|--------------|-------------------|
| 7Li | 0.004 | 1.21 | 1.42 | 117 | 6.5 |
| 23Na | 2.79 | 14,000 | 16,513 | 118 | 4.6 |
| 24Mg | 0.047 | 910 | 1,059 | 116 | 3.3 |
| 27Al | 0.076 | 1,280 | 1,620 | 127 | 6.7 |
| 31P | 56.7 | 8,000 | 9,227 | 115 | 6.1 |
| 39K | 3.13 | 15,500 | 17,750 | 115 | 7.3 |
| 44Ca | 22.1 | 2,360 | 2,874 | 122 | 5.0 |
| 51V | 0.009 | 1.57 | 1.86 | 119 | 10.0 |
| 52Cr | 0.107 | 1.87 | 2.18 | 117 | 3.7 |
| 55Mn | 0.005 | 3.17 | 3.74 | 118 | 2.6 |
| 57Fe | 0.938 | 343 | 405 | 118 | 2.7 |
| 59Co | 0.008 | 0.250 | 0.302 | 121 | 3.3 |
| 60Ni | 0.009 | 1.34 | 1.62 | 121 | 2.4 |
| 63Cu | 0.004 | 15.7 | 19.7 | 125 | 6.1 |
| 66Zn | 0.063 | 51.6 | 61.4 | 119 | 6.7 |
| 75As | 0.044 | 6.87 | 7.59 | 110 | 1.9 |
| 77Se | 0.165 | 3.45 | 3.72 | 108 | 6.2 |
| 88Sr | 0.0004 | 10.1 | 11.9 | 118 | 3.4 |
| 95Mo | 0.003 | 0.290 | 0.339 | 117 | 3.7 |
| 111Cd | 0.014 | 0.299 | 0.407 | 136* | 4.5 |
| 118Sn | 0.009 | 0.061 | 0.076 | 124 | 3.2 |
| 202Hg | 0.028 | 0.412 | 0.483 | 117 | 9.9 |
| 208Pb | 0.001 | 0.404 | 0.498 | 123 | 16.9 |
| 238U | 0.00010 | 0.050 | 0.063 | 127 | 13.2 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

* reported accuracy for cadmium is outside of guidance specification

Data Quality Objectives:

Accuracy: 70 - 130% of the certified values for the method (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016)

BC laboratory standards for RSD (precision) of reference material are not available; therefore a DQO ≤20% was established for all elements

SRC SAMPLE SAMPLE DESCRIPTION

41379 05/17/2019 RG_LNLK-RSC-11-M_20190517 *TISSUE*
41380 05/17/2019 RG_LNLK-RSC-12-M_20190517 *TISSUE*
41381 05/17/2019 RG_LNLK-RSC-13-M_20190517 *TISSUE*
41382 05/20/2019 RG_LNLK-RSC-14-M_20190520 *TISSUE*
41383 05/20/2019 RG_LNLK-RSC-15-M_20190520 *TISSUE*
41384 05/20/2019 RG_LNLK-RSC-16-M_20190520 *TISSUE*
41385 05/20/2019 RG_LNLK-RSC-17-M_20190520 *TISSUE*
41386 05/20/2019 RG_LNLK-RSC-18-M_20190520 *TISSUE*
41387 05/20/2019 RG_LNLK-RSC-19-M_20190520 *TISSUE*
41388 05/20/2019 RG_LNLK-RSC-20-M_20190520 *TISSUE*
41389 05/15/2019 RG_STPD-RSC-01-M_20190515 *TISSUE*
41390 05/24/2019 RG_STPD-RSC-02-M_20190524 *TISSUE*
41391 05/24/2019 RG_STPD-RSC-03-M_20190524 *TISSUE*
41392 05/24/2019 RG_STPD-RSC-04-M_20190524 *TISSUE*
41393 05/24/2019 RG_STPD-RSC-05-M_20190524 *TISSUE*
41394 05/24/2019 RG_STPD-RSC-06-M_20190524 *TISSUE*
41395 05/24/2019 RG_STPD-RSC-07-M_20190524 *TISSUE*
41396 05/30/2019 RG_STPD-RSC-08-M_20190530 *TISSUE*
41397 05/30/2019 RG_STPD-RSC-09-M_20190530 *TISSUE*
41398 05/30/2019 RG_STPD-RSC-10-M_20190530 *TISSUE*
41399 05/31/2019 RG_STPD-RSC-11-M_20190531 *TISSUE*
41400 05/31/2019 RG_STPD-RSC-12-M_20190531 *TISSUE*
41401 06/01/2019 RG_STPD-RSC-13-M_20190601 *TISSUE*
41402 05/15/2019 RG_ERIMF-RSC-04-M_20190515 *TISSUE*
41403 05/17/2019 RG_ERIMF-RSC-05-M_20190517 *TISSUE*
41404 05/21/2019 RG_ERIMF-RSC-06-M_20190521 *TISSUE*
41405 05/23/2019 RG_ERIMF-RSC-07-M_20190523 *TISSUE*
41406 05/23/2019 RG_ERIMF-RSC-08-M_20190523 *TISSUE*
41407 05/23/2019 RG_ERIMF-RSC-09-M_20190523 *TISSUE*
41408 05/23/2019 RG_ERIMF-RSC-10-M_20190523 *TISSUE*
41409 05/23/2019 RG_ERIMF-RSC-11-M_20190523 *TISSUE*
41410 05/23/2019 RG_ERIMF-RSC-12-M_20190523 *TISSUE*
41411 05/23/2019 RG_ERIMF-RSC-13-M_20190523 *TISSUE*
41412 05/23/2019 RG_ERIMF-RSC-14-M_20190523 *TISSUE*
41413 05/23/2019 RG_ERIMF-RSC-15-M_20190523 *TISSUE*
41414 05/23/2019 RG_ERIMF-RSC-16-M_20190523 *TISSUE*
41415 05/24/2019 RG_ERWSF-RSC-01-M_20190524 *TISSUE*
41416 05/29/2019 RG_ERWSF-RSC-02-M_20190529 *TISSUE*
41417 05/30/2019 RG_ERWSF-RSC-03-M_20190530 *TISSUE*
41418 06/24/2019 RG_ER_RSC_01-M_20190624 *TISSUE*
41419 06/24/2019 RG_ER_RSC_02-M_20190624 *TISSUE*
41420 06/24/2019 RG_ER_RSC_03-M_20190624 *TISSUE*
41421 06/24/2019 RG_ER_RSC_04-M_20190624 *TISSUE*
41422 06/24/2019 RG_ER_RSC_05-M_20190624 *TISSUE*
41423 06/24/2019 RG_ER_RSC_06-M_20190624 *TISSUE*
41424 06/24/2019 RG_ER_RSC_07-M_20190624 *TISSUE*
41425 06/24/2019 RG_ER_RSC_08-M_20190624 *TISSUE*
41426 06/22/2019 RG_ER_RSC_09-M_20190624 *TISSUE*
41427 06/22/2019 RG_ER_RSC_010-M_20190624 *TISSUE*
41428 06/22/2019 RG_ER_RSC_11-M_20190622 *TISSUE*
41429 06/22/2019 RG_ER_RSC_12-M_20190622 *TISSUE*
41430 06/22/2019 RG_ER_RSC_13-M_20190622 *TISSUE*
41431 06/22/2019 RG_ER_RSC_14-M_20190622 *TISSUE*
41432 06/04/2019 RG_STPD_RSC_14-M2019 *TISSUE*
41433 06/04/2019 RG_STPD_RSC_15-M2019 *TISSUE*
41434 06/04/2019 RG_STPD_RSC_16-M2019 *TISSUE*

ATTN: JENNIE CHRISTENSEN
PH: (250) 532-1084
TRICHANALYTICS
207-1753 SEAN HEIGHTS
SAANICHTON, BC V8M 0B3

SRC Residual Ovary Analysis

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited
421 Pine Avenue
Sparwood, BC V0B 2G0
Attn: Cait Good

Date Samples Received: Jul-12-2019

Client P.O.: VPO00616225

All results have been reviewed and approved by a Qualified Person in accordance with the Saskatchewan Environmental Code, Corrective Action Plan Chapter, for the purposes of certifying a laboratory analysis

Results from Lab Section 2 authorized by Keith Gipman, Supervisor
Results from Lab Section 6 authorized by Marion McConnell, Supervisor

-
- * Test methods and data are validated by the laboratory's Quality Assurance Program.
 - * Routine methods follow recognized procedures from sources such as
 - * Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF
 - * Environment Canada
 - * US EPA
 - * CANMET
 - * The results reported relate only to the test samples as provided by the client.
 - * Samples will be kept for 30 days after the final report is sent. Please contact the lab if you have any special requirements.
 - * Additional information is available upon request.

This is a final report.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited
 421 Pine Avenue
 Sparwood, BC V0B 2G0
 Attn: Cait Good

Sample #: **2019038442**
 Date Sampled: **May 17, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/17/2019 RG_LNLK-RSC-11-O_20190517**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 11 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 6 | 5 |
| Iron | ug/g | 100 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 18 | 5 |
| Mercury | ug/g | 0.04 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 1.2 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 200 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.62 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038443**
Date Sampled: **May 17, 2019**
Sample Matrix: **TISSUE**
Description: **05/17/2019 RG_LNLK-RSC-12-O_20190517**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 4.7 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.8 | 0.5 |
| Iron | ug/g | 65 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 14 | 0.5 |
| Mercury | ug/g | <0.01 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.4 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 180 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.04 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038444**
Date Sampled: **May 17, 2019**
Sample Matrix: **TISSUE**
Description: **05/17/2019 RG_LNLK-RSC-13-O_20190517**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.12 | 0.05 |
| Barium | ug/g | 9.4 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.1 | 0.5 |
| Iron | ug/g | 63 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 9.1 | 0.5 |
| Mercury | ug/g | 0.03 | 0.01 |
| Molybdenum | ug/g | 0.10 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.3 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 200 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 67.84 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038445**
Date Sampled: **May 20, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-14-O_20190520**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 7 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.07 | 0.05 |
| Barium | ug/g | 12 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 1.4 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.6 | 0.5 |
| Iron | ug/g | 85 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 16 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.4 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 180 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.60 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038446**
 Date Sampled: **May 20, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/20/2019 RG_LNLK-RSC-15-O_20190520**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.05 |
| Barium | ug/g | 9.9 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.6 | 0.5 |
| Iron | ug/g | 68 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 9.0 | 0.5 |
| Mercury | ug/g | 0.06 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.4 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 220 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.49 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038447**
Date Sampled: **May 20, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-16-O_20190520**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.12 | 0.05 |
| Barium | ug/g | 6.6 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 5.9 | 0.5 |
| Iron | ug/g | 63 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 16 | 0.5 |
| Mercury | ug/g | 0.03 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.5 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 150 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 67.76 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038448** Client PO #: **VPO00616225**
Date Sampled: **May 20, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-17-O_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 7 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 5 | 5 |
| Iron | ug/g | 80 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 19 | 5 |
| Mercury | ug/g | 0.03 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 2.0 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 200 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.52 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038449** Client PO #: **VPO00616225**
Date Sampled: **May 20, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-18-O_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.09 | 0.05 |
| Barium | ug/g | 9.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.0 | 0.5 |
| Iron | ug/g | 49 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.7 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 160 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 48.26 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038450** Client PO #: **VPO00616225**
Date Sampled: **May 20, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-19-O_20190520**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.15 | 0.05 |
| Barium | ug/g | 6.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 5.4 | 0.5 |
| Iron | ug/g | 64 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 14 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.09 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.6 | 0.05 |
| Silver | ug/g | 0.04 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.90 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038451**
Date Sampled: **May 20, 2019**
Sample Matrix: **TISSUE**
Description: **05/20/2019 RG_LNLK-RSC-20-O_20190520**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.18 | 0.05 |
| Barium | ug/g | 7.7 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.8 | 0.5 |
| Iron | ug/g | 73 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 12 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 1.6 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.56 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038452** Client PO #: **VPO00616225**
Date Sampled: **May 15, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/15/2019 RG_STPD-RSC-01-O_20190515**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.05 |
| Barium | ug/g | 2.6 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.45 | 0.02 |
| Chromium | ug/g | 0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.6 | 0.5 |
| Iron | ug/g | 85 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 9.7 | 0.5 |
| Mercury | ug/g | 0.01 | 0.01 |
| Molybdenum | ug/g | 0.19 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 35 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.05 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 180 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.47 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038453** Client PO #: **VPO00616225**
Date Sampled: **May 24, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/24/2019 RG_STPD-RSC-02-O_20190524**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 0.7 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 5.0 | 0.5 |
| Iron | ug/g | 73 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | <0.01 | 0.01 |
| Molybdenum | ug/g | 0.13 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 35 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | 0.05 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 160 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.43 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038454**
 Date Sampled: **May 24, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/24/2019 RG_STPD-RSC-03-O_20190524**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.15 | 0.05 |
| Barium | ug/g | 1.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.9 | 0.5 |
| Iron | ug/g | 51 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 6.3 | 0.5 |
| Mercury | ug/g | 0.01 | 0.01 |
| Molybdenum | ug/g | 0.16 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 31 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.06 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 140 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.24 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038455**
Date Sampled: **May 24, 2019**
Sample Matrix: **TISSUE**
Description: **05/24/2019 RG_STPD-RSC-04-O_20190524**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.05 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 5.0 | 0.5 |
| Iron | ug/g | 88 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.19 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 39 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.42 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038456**
Date Sampled: **May 24, 2019**
Sample Matrix: **TISSUE**
Description: **05/24/2019 RG_STPD-RSC-05-O_20190524**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.07 | 0.05 |
| Barium | ug/g | 3.0 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.4 | 0.5 |
| Iron | ug/g | 74 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 18 | 0.5 |
| Mercury | ug/g | 0.01 | 0.01 |
| Molybdenum | ug/g | 0.18 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 34 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | 0.03 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.49 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038457**
Date Sampled: **May 24, 2019**
Sample Matrix: **TISSUE**
Description: **05/24/2019 RG_STPD-RSC-06-O_20190524**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.7 | 0.5 |
| Iron | ug/g | 51 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 10 | 0.5 |
| Mercury | ug/g | <0.01 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 28 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 160 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 69.73 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038458**
 Date Sampled: **May 24, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/24/2019 RG_STPD-RSC-07-O_20190524**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 18 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 41 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 180 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.35 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038459** Client PO #: **VPO00616225**
Date Sampled: **May 30, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/30/2019 RG_STPD-RSC-08-O_20190530**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 80 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 11 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 36 | 0.5 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 160 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.67 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038460** Client PO #: **VPO00616225**
Date Sampled: **May 30, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/30/2019 RG_STPD-RSC-09-O_20190530**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 70 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 8 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 28 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 120 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 57.88 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038461**
Date Sampled: **May 30, 2019**
Sample Matrix: **TISSUE**
Description: **05/30/2019 RG_STPD-RSC-10-O_20190530**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 1.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 5.1 | 0.5 |
| Iron | ug/g | 58 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.01 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 30 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.04 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 160 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 69.29 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038462**
Date Sampled: **May 31, 2019**
Sample Matrix: **TISSUE**
Description: **05/31/2019 RG_STPD-RSC-11-O_20190531**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.9 | 0.5 |
| Iron | ug/g | 84 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.01 | 0.01 |
| Molybdenum | ug/g | 0.17 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 44 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.04 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.01 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038463**
Date Sampled: **May 31, 2019**
Sample Matrix: **TISSUE**
Description: **05/31/2019 RG_STPD-RSC-12-O_20190531**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 11 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 34 | 0.5 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 210 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.77 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038464**
 Date Sampled: **Jun 01, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/01/2019 RG_STPD-RSC-13-O_20190601**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 90 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 12 | 5 |
| Mercury | ug/g | 0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 42 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.15 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038465**
 Date Sampled: **May 15, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/15/2019 RG_ERIMF-RSC-04-O_20190515**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.03 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 19 | 5 |
| Mercury | ug/g | 0.04 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 7.6 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 180 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.78 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038466**
Date Sampled: **May 17, 2019**
Sample Matrix: **TISSUE**
Description: **05/17/2019 RG_ERIMF-RSC-05-O_20190517**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 9 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 12 | 5 |
| Mercury | ug/g | 0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 9.3 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 260 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.65 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038467** Client PO #: **VPO00616225**
Date Sampled: **May 21, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/21/2019 RG_ERIMF-RSC-06-O_20190521**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 7 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 13 | 5 |
| Mercury | ug/g | 0.03 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 3.8 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.07 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038468**
Date Sampled: **May 23, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-07-O_20190523**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.10 | 0.05 |
| Barium | ug/g | 3.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.3 | 0.5 |
| Iron | ug/g | 50 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 14 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 5.7 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 160 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.03 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038469** Client PO #: **VPO00616225**
Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-08-O_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.09 | 0.05 |
| Barium | ug/g | 1.0 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.6 | 0.5 |
| Iron | ug/g | 57 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.19 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 12 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 150 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 71.95 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038470**
Date Sampled: **May 23, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-09-O_20190523**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.05 |
| Barium | ug/g | 1.9 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.3 | 0.5 |
| Iron | ug/g | 60 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | 0.03 | 0.01 |
| Molybdenum | ug/g | 0.21 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 7.7 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 170 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.57 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038471** Client PO #: **VPO00616225**
Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-10-O_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 12 | 5 |
| Antimony | ug/g | 0.02 | 0.02 |
| Arsenic | ug/g | 0.09 | 0.05 |
| Barium | ug/g | 16 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 2.1 | 0.5 |
| Iron | ug/g | 28 | 5 |
| Lead | ug/g | 0.10 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.30 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 2.0 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 22 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | 0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 120 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.32 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038472**
Date Sampled: **May 23, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-11-O_20190523**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 14 | 5 |
| Mercury | ug/g | 0.04 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 12 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.82 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038473**
Date Sampled: **May 23, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-12-O_20190523**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 8 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 5 | 5 |
| Iron | ug/g | 90 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 18 | 5 |
| Mercury | ug/g | 0.04 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 6.7 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 250 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.44 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038474** Client PO #: **VPO00616225**
Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-13-O_20190523**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 8 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 90 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 8 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 5.3 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.54 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038475**
 Date Sampled: **May 23, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/23/2019 RG_ERIMF-RSC-14-O_20190523**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 11 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 100 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 18 | 5 |
| Mercury | ug/g | 0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 20 | 0.5 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 260 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.15 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038476**
Date Sampled: **May 23, 2019**
Sample Matrix: **TISSUE**
Description: **05/23/2019 RG_ERIMF-RSC-15-O_20190523**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 6 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 5 | 5 |
| Iron | ug/g | 80 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 15 | 5 |
| Mercury | ug/g | 0.03 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 6.4 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 210 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.24 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038477**
 Date Sampled: **May 23, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/23/2019 RG_ERIMF-RSC-16-O_20190523**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 13 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 90 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 12 | 5 |
| Mercury | ug/g | 0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 8.4 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 230 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.53 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038478**
Date Sampled: **May 24, 2019**
Sample Matrix: **TISSUE**
Description: **05/24/2019 RG_ERWSF-RSC-01-O_20190524**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.08 | 0.05 |
| Barium | ug/g | 0.7 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.9 | 0.5 |
| Iron | ug/g | 68 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.03 | 0.01 |
| Molybdenum | ug/g | 0.21 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 20 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.2 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 180 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.41 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038479**
 Date Sampled: **May 29, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/29/2019 RG_ERWSF-RSC-02-O_20190529**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.12 | 0.05 |
| Barium | ug/g | 1.0 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.2 | 0.5 |
| Iron | ug/g | 88 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 12 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.18 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 13 | 0.05 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | 0.2 | 0.1 |
| Thallium | ug/g | <0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 190 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.17 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038480**
Date Sampled: **May 30, 2019**
Sample Matrix: **TISSUE**
Description: **05/30/2019 RG_ERWSF-RSC-03-O_20190530**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 10 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | <0.05 | 0.05 |
| Barium | ug/g | 1.4 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 2.6 | 0.5 |
| Iron | ug/g | 69 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 8.3 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.10 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 11 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.2 | 0.1 |
| Thallium | ug/g | 0.01 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 130 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 69.81 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038481** Client PO #: **VPO00616225**
 Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/23/2019 RG_ERIMF-RSC-10-O_20190523-DUP**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | 7 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.03 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 16 | 5 |
| Mercury | ug/g | 0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 9.2 | 0.5 |
| Silver | ug/g | 0.03 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 170 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 69.07 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038482** Client PO #: **VPO00616225**
 Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/23/2019 RG_ERIMF-RSC-11-O_20190523-DUP**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | <50 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 15 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 13 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 200 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 68.84 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038483** Client PO #: **VPO00616225**
 Date Sampled: **May 23, 2019** Date Received: **Jul 12, 2019**
 Sample Matrix: **TISSUE**
 Description: **05/23/2019 RG_ERIMF-RSC-13-O_20190523-DUP**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 70 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 7 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 4.6 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 150 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 68.00 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038484** Client PO #: **VPO00616225**
Date Sampled: **Jun 04, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **06/04/2019 RG_STPD-RSC-14-O_20190604-DUP**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 12 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 30 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.37 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038485** Client PO #: **VPO00616225**
Date Sampled: **Jun 04, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **06/04/2019 RG_STPD-RSC-15-O_20190604-DUP**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 70 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 10 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 33 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.23 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038486**
 Date Sampled: **Jun 04, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/04/2019 RG_STPD-RSC-14-O_20190604**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 11 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 26 | 0.5 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 160 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 69.95 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038487**
 Date Sampled: **Jun 04, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/04/2019 RG_STPD-RSC-15-O_20190604**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | <5 | 5 |
| Iron | ug/g | 60 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 9 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 31 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 190 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 81.23 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038488**
 Date Sampled: **Jun 13, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/13/2019 RG_ER-RSC-01-O_20190613**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.06 | 0.02 |
| Barium | ug/g | 0.39 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | 0.1 | 0.1 |
| Cobalt | ug/g | 0.12 | 0.02 |
| Copper | ug/g | 5.0 | 0.1 |
| Iron | ug/g | 90 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 13 | 0.2 |
| Mercury | ug/g | 0.06 | 0.01 |
| Molybdenum | ug/g | 0.16 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 22 | 0.02 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 220 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.93 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038489**
Date Sampled: **Jun 13, 2019**
Sample Matrix: **TISSUE**
Description: **06/13/2019 RG_ER-RSC-02-O_20190613**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.13 | 0.02 |
| Barium | ug/g | 1.0 | 0.05 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <2 | 2 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.1 | 0.1 |
| Cobalt | ug/g | 0.07 | 0.02 |
| Copper | ug/g | 4.5 | 0.1 |
| Iron | ug/g | 85 | 5 |
| Lead | ug/g | <0.02 | 0.02 |
| Manganese | ug/g | 10 | 0.2 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.15 | 0.05 |
| Nickel | ug/g | <0.1 | 0.1 |
| Selenium | ug/g | 18 | 0.02 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.1 | 0.1 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.01 | 0.01 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 220 | 1 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.84 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038490**
Date Sampled: **Jun 14, 2019**
Sample Matrix: **TISSUE**
Description: **06/14/2019 RG_ER-RSC-03-O_20190614**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.18 | 0.05 |
| Barium | ug/g | 2.5 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.2 | 0.5 |
| Iron | ug/g | 95 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.05 | 0.01 |
| Molybdenum | ug/g | 0.08 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 25 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 260 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 75.11 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038491**
 Date Sampled: **Jun 22, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/22/2019 RG_ER-RSC-04-O_20190622**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.19 | 0.05 |
| Barium | ug/g | 1.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.13 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.7 | 0.5 |
| Iron | ug/g | 100 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 12 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | <0.05 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 22 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 290 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.56 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038492**
Date Sampled: **Jun 22, 2019**
Sample Matrix: **TISSUE**
Description: **06/22/2019 RG_ER-RSC-05-O_20190622**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.14 | 0.05 |
| Barium | ug/g | 1.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.07 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.4 | 0.5 |
| Iron | ug/g | 150 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 16 | 0.5 |
| Mercury | ug/g | 0.07 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 27 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 300 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 77.90 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038493** Client PO #: **VPO00616225**
Date Sampled: **Jun 24, 2019** Date Received: **Jul 12, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-06-O_20190624**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 18 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.93 | 0.05 |
| Barium | ug/g | 2.4 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 4.4 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 11 | 0.5 |
| Iron | ug/g | 350 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 10 | 0.5 |
| Mercury | ug/g | 0.10 | 0.01 |
| Molybdenum | ug/g | 0.27 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 19 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 1.5 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 250 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.06 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038494**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-07-O_20190624**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 9 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.39 | 0.05 |
| Barium | ug/g | 2.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.26 | 0.02 |
| Chromium | ug/g | 0.8 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.7 | 0.5 |
| Iron | ug/g | 99 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 9.2 | 0.5 |
| Mercury | ug/g | 0.03 | 0.01 |
| Molybdenum | ug/g | 0.11 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 14 | 0.05 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 200 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.28 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038495**
 Date Sampled: **Jun 24, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/24/2019 RG_ER-RSC-08-O_20190624**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.15 | 0.05 |
| Barium | ug/g | 1.1 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.6 | 0.5 |
| Iron | ug/g | 94 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 6.2 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.10 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 36 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.4 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 240 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.59 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038496**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-09-O_20190624**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.34 | 0.05 |
| Barium | ug/g | 1.2 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.15 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.5 | 0.5 |
| Iron | ug/g | 110 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 11 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.08 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 26 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 230 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.41 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038497**
 Date Sampled: **Jun 24, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/24/2019 RG_ER-RSC-10-O_20190624**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.25 | 0.05 |
| Barium | ug/g | 1.6 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.6 | 0.5 |
| Iron | ug/g | 87 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | 0.05 | 0.01 |
| Molybdenum | ug/g | 0.13 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 16 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 230 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 74.71 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038498**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-11-O_20190624**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | 6 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.22 | 0.05 |
| Barium | ug/g | 3.0 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.04 | 0.02 |
| Chromium | ug/g | 3.4 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.0 | 0.5 |
| Iron | ug/g | 170 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 15 | 0.5 |
| Mercury | ug/g | 0.02 | 0.01 |
| Molybdenum | ug/g | 0.08 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 18 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 8.3 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 250 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 70.67 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038499**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-12-O_20190624**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.11 | 0.05 |
| Barium | ug/g | 1.5 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.05 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | 0.6 | 0.5 |
| Copper | ug/g | 4.5 | 0.5 |
| Iron | ug/g | 100 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 13 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.12 | 0.05 |
| Nickel | ug/g | 0.6 | 0.5 |
| Selenium | ug/g | 38 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.5 | 0.1 |
| Thallium | ug/g | 0.02 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 260 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 76.99 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038500**
Date Sampled: **Jun 24, 2019**
Sample Matrix: **TISSUE**
Description: **06/24/2019 RG_ER-RSC-13-O_20190624**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.18 | 0.05 |
| Barium | ug/g | 1.8 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.02 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 3.7 | 0.5 |
| Iron | ug/g | 87 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 10 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.10 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 23 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.6 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 210 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 73.45 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019038501**
 Date Sampled: **Jun 24, 2019**
 Sample Matrix: **TISSUE**
 Description: **06/24/2019 RG_ER-RSC-14-O_20190624**

Client PO #: **VPO00616225**
 Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <5 | 5 |
| Antimony | ug/g | <0.02 | 0.02 |
| Arsenic | ug/g | 0.25 | 0.05 |
| Barium | ug/g | 1.4 | 0.5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <5 | 5 |
| Cadmium | ug/g | 0.10 | 0.02 |
| Chromium | ug/g | <0.5 | 0.5 |
| Cobalt | ug/g | <0.5 | 0.5 |
| Copper | ug/g | 4.1 | 0.5 |
| Iron | ug/g | 90 | 5 |
| Lead | ug/g | <0.05 | 0.05 |
| Manganese | ug/g | 8.4 | 0.5 |
| Mercury | ug/g | 0.04 | 0.01 |
| Molybdenum | ug/g | 0.07 | 0.05 |
| Nickel | ug/g | <0.5 | 0.5 |
| Selenium | ug/g | 16 | 0.05 |
| Silver | ug/g | <0.02 | 0.02 |
| Strontium | ug/g | 0.3 | 0.1 |
| Thallium | ug/g | 0.03 | 0.01 |
| Tin | ug/g | <0.2 | 0.2 |
| Titanium | ug/g | <0.5 | 0.5 |
| Uranium | ug/g | <0.02 | 0.02 |
| Vanadium | ug/g | <0.2 | 0.2 |
| Zinc | ug/g | 200 | 5 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.95 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

SRC Group # 2019-9707

Aug 06, 2019

Teck Coal Limited

Sample #: **2019039126**
Date Sampled: **Jun 04, 2019**
Sample Matrix: **TISSUE**
Description: **06/04/2019 RG_STPD_RSC_16_0_20190604**

Client PO #: **VPO00616225**
Date Received: **Jul 12, 2019**

| Analyte | Units | Result | DL |
|----------------------|-------|--------|------|
| Lab Section 2 | | | |
| Aluminum | ug/g | <50 | 50 |
| Antimony | ug/g | <0.1 | 0.1 |
| Arsenic | ug/g | <0.5 | 0.5 |
| Barium | ug/g | <5 | 5 |
| Beryllium | ug/g | <0.02 | 0.02 |
| Boron | ug/g | <50 | 50 |
| Cadmium | ug/g | <0.02 | 0.02 |
| Chromium | ug/g | <5 | 5 |
| Cobalt | ug/g | <5 | 5 |
| Copper | ug/g | 5 | 5 |
| Iron | ug/g | 80 | 50 |
| Lead | ug/g | <0.5 | 0.5 |
| Manganese | ug/g | 12 | 5 |
| Mercury | ug/g | <0.02 | 0.02 |
| Molybdenum | ug/g | <0.5 | 0.5 |
| Nickel | ug/g | <5 | 5 |
| Selenium | ug/g | 40 | 0.5 |
| Silver | ug/g | 0.02 | 0.02 |
| Strontium | ug/g | <1 | 1 |
| Thallium | ug/g | <0.1 | 0.1 |
| Tin | ug/g | <2 | 2 |
| Titanium | ug/g | <5 | 5 |
| Uranium | ug/g | <0.1 | 0.1 |
| Vanadium | ug/g | <1 | 1 |
| Zinc | ug/g | 170 | 50 |

Lab Section 6

| | | | |
|----------|---|-------|------|
| Moisture | % | 72.76 | 0.02 |
|----------|---|-------|------|

Symbol of "<" means "less than". This indicates that it was not detected at level stated above.

The temperature of the cooler was 10.7 °C upon receipt.

Results are reported on a dry basis.

Variability in detection limits due to sample size.

There was no sample remaining to perform rechecks due to limited sample weight submitted to the laboratory.

Aug 06, 2019

This report was generated for samples included in SRC Group # 2019-9707

Quality Control Report

Cait Good
Teck Coal Limited
421 Pine Avenue
Sparwood, BC V0B 2G0

Reference Materials and Standards:

A reference material of known concentration is used whenever possible as either a control sample or control standard and analyzed with each batch of samples. These "QC" results are used to assess the performance of the method and must be within clearly defined limits; otherwise corrective action is required.

| QC Analysis | Units | Target Value | Obtained Value |
|-------------|-------|--------------|----------------|
| Aluminum | ug/g | 1280 | 1300 |
| Aluminum | ug/g | 1280 | 1240 |
| Arsenic | ug/g | 6.87 | 7.27 |
| Arsenic | ug/g | 6.87 | 6.68 |
| Cadmium | ug/g | 0.299 | 0.295 |
| Cadmium | ug/g | 0.299 | 0.283 |
| Chromium | ug/g | 1.57 | 1.59 |
| Chromium | ug/g | 1.57 | 1.54 |
| Copper | ug/g | 13.8 | 14.4 |
| Copper | ug/g | 13.8 | 13.4 |
| Iron | ug/g | 312 | 306 |
| Iron | ug/g | 312 | 289 |
| Lead | ug/g | 0.404 | 0.400 |
| Lead | ug/g | 0.404 | 0.368 |
| Manganese | ug/g | 2.70 | 2.82 |
| Manganese | ug/g | 2.70 | 2.75 |
| Mercury | ug/g | 0.364 | 0.318 |
| Mercury | ug/g | 0.364 | 0.294 |
| Nickel | ug/g | 1.20 | 1.21 |
| Nickel | ug/g | 1.20 | 1.13 |
| Selenium | ug/g | 3.45 | 3.71 |
| Selenium | ug/g | 3.45 | 3.51 |
| Silver | ug/g | 0.0234 | 0.0255 |
| Silver | ug/g | 0.0234 | 0.0245 |
| Zinc | ug/g | 47.8 | 45.2 |
| Zinc | ug/g | 47.8 | 41.9 |

Please note, duplicates could not be analyzed for ICP due to insufficient sample available.

All quality control results were within the specified limits and considered acceptable.

Roxane Ortmann - Quality Assurance Supervisor

Group #: 2019-9707

Client: Teck Coal

| Sample # | % | % | Wet to Freeze | | |
|------------|----------|---------|---------------|---------------------|------------------|
| SRC Sample | Moisture | Solid | Conversion | Dry Analysis Weight | Wet Weight Basis |
| 38442 | 71.6233 | 28.3767 | 3.5240 | 0.0205 | 0.0722 |
| 38443 | 70.0393 | 29.9607 | 3.3377 | 0.0288 | 0.0961 |
| 38444 | 67.8363 | 32.1637 | 3.1091 | 0.0338 | 0.1051 |
| 38445 | 73.6000 | 26.4000 | 3.7879 | 0.0324 | 0.1227 |
| 38446 | 72.4876 | 27.5124 | 3.6347 | 0.0741 | 0.2693 |
| 38447 | 67.7560 | 32.2440 | 3.1014 | 0.0552 | 0.1712 |
| 38448 | 72.5166 | 27.4834 | 3.6386 | 0.0206 | 0.0750 |
| 38449 | 48.2625 | 51.7375 | 1.9328 | 0.0465 | 0.0899 |
| 38450 | 73.9007 | 26.0993 | 3.8315 | 0.0385 | 0.1475 |
| 38451 | 71.5643 | 28.4357 | 3.5167 | 0.0395 | 0.1389 |
| 38452 | 71.4747 | 28.5253 | 3.5057 | 0.0516 | 0.1809 |
| 38453 | 71.4286 | 28.5714 | 3.5000 | 0.0628 | 0.2198 |
| 38454 | 70.2375 | 29.7625 | 3.3599 | 0.0495 | 0.1663 |
| 38455 | 74.4220 | 25.5780 | 3.9096 | 0.0504 | 0.1970 |
| 38456 | 72.4894 | 27.5106 | 3.6350 | 0.0305 | 0.1109 |
| 38457 | 69.7342 | 30.2658 | 3.3041 | 0.0466 | 0.1540 |
| 38458 | 72.3497 | 27.6503 | 3.6166 | 0.0244 | 0.0882 |
| 38459 | 72.6708 | 27.3292 | 3.6591 | 0.0257 | 0.0940 |
| 38460 | 57.8797 | 42.1203 | 2.3741 | 0.0095 | 0.0226 |
| 38461 | 69.2925 | 30.7075 | 3.2565 | 0.0419 | 0.1364 |
| 38462 | 73.0116 | 26.9884 | 3.7053 | 0.0303 | 0.1123 |
| 38463 | 71.7697 | 28.2303 | 3.5423 | 0.0184 | 0.0652 |
| 38464 | 71.1538 | 28.8462 | 3.4667 | 0.0236 | 0.0818 |
| 38465 | 73.7819 | 26.2181 | 3.8142 | 0.0212 | 0.0809 |
| 38466 | 72.6457 | 27.3543 | 3.6557 | 0.013 | 0.0475 |
| 38467 | 70.0671 | 29.9329 | 3.3408 | 0.0191 | 0.0638 |
| 38468 | 73.0333 | 26.9667 | 3.7083 | 0.0697 | 0.2585 |
| 38469 | 71.9530 | 28.0470 | 3.5654 | 0.0592 | 0.2111 |
| 38470 | 72.5686 | 27.4314 | 3.6455 | 0.0341 | 0.1243 |
| 38471 | 70.3226 | 29.6774 | 3.3696 | 0.0406 | 0.1368 |
| 38472 | 77.8243 | 22.1757 | 4.5094 | 0.0137 | 0.0618 |
| 38473 | 74.4420 | 25.5580 | 3.9127 | 0.0214 | 0.0837 |
| 38474 | 73.5380 | 26.4620 | 3.7790 | 0.0164 | 0.0620 |
| 38475 | 74.1512 | 25.8488 | 3.8686 | 0.0187 | 0.0723 |
| 38476 | 72.2437 | 27.7563 | 3.6028 | 0.0192 | 0.0692 |
| 38477 | 73.5294 | 26.4706 | 3.7778 | 0.0144 | 0.0544 |
| 38478 | 76.4105 | 23.5895 | 4.2392 | 0.0518 | 0.2196 |
| 38479 | 74.1688 | 25.8312 | 3.8713 | 0.03 | 0.1161 |
| 38480 | 69.8132 | 30.1868 | 3.3127 | 0.0289 | 0.0957 |
| 38481 | 69.0722 | 30.9278 | 3.2333 | 0.0182 | 0.0588 |
| 38482 | 68.8442 | 31.1558 | 3.2097 | 0.0038 | 0.0122 |

| | | | | | |
|-------|---------|---------|--------|--------|--------|
| 38483 | 68.0000 | 32.0000 | 3.1250 | 0.0111 | 0.0347 |
| 38484 | 70.3665 | 29.6335 | 3.3746 | 0.0254 | 0.0857 |
| 38485 | 74.2284 | 25.7716 | 3.8802 | 0.0249 | 0.0966 |
| 38486 | 69.9513 | 30.0487 | 3.3279 | 0.0162 | 0.0539 |
| 38487 | 81.2325 | 18.7675 | 5.3284 | 0.0226 | 0.1204 |
| 38488 | 74.9347 | 25.0653 | 3.9896 | 0.1662 | 0.6631 |
| 38489 | 72.8427 | 27.1573 | 3.6823 | 0.1602 | 0.5899 |
| 38490 | 75.1060 | 24.8940 | 4.0170 | 0.0339 | 0.1362 |
| 38491 | 74.5550 | 25.4450 | 3.9301 | 0.0345 | 0.1356 |
| 38492 | 77.9022 | 22.0978 | 4.5253 | 0.0439 | 0.1987 |
| 38493 | 73.0589 | 26.9411 | 3.7118 | 0.0454 | 0.1685 |
| 38494 | 70.2760 | 29.7240 | 3.3643 | 0.0373 | 0.1255 |
| 38495 | 73.5876 | 26.4124 | 3.7861 | 0.0697 | 0.2639 |
| 38496 | 73.4096 | 26.5904 | 3.7608 | 0.0335 | 0.1260 |
| 38497 | 74.7121 | 25.2879 | 3.9545 | 0.046 | 0.1819 |
| 38498 | 70.6677 | 29.3323 | 3.4092 | 0.0398 | 0.1357 |
| 38499 | 76.9861 | 23.0139 | 4.3452 | 0.0694 | 0.3016 |
| 38500 | 73.4485 | 26.5515 | 3.7663 | 0.0441 | 0.1661 |
| 38501 | 72.9487 | 27.0513 | 3.6967 | 0.0592 | 0.2188 |
| 39126 | 72.7637 | 27.2363 | 3.6716 | 0.0182 | 0.0668 |

TrichAnalytics Residual Ovary Analysis



TrichAnalyticals Inc.

Fish Ovary Tissue Microchemistry Analysis Report

Client:

James Elphick
Nautilus Environmental Inc.
8664 Commerce Court, Burnaby, BC
V8A 4N7
Ph: 250-216-8420
[Email: james@nautilusenvironmental.com](mailto:james@nautilusenvironmental.com)

Date Received:

28 May 2019

Final Report Date:

17 Jun 2019

Project No.

2019-059

Report Revision

Rev.2

Metals Analytical Request: Fish Tissue Microchemistry – 8 Fish ovary tissue samples

Fish Ovary Tissue Sample IDs: RG_STPD-RSC-01-R-O_20190521*; RG_STPD-RSC-02-R-O_20190524
 RG_STPD-RSC-03-R-O_20190524; RG_STPD-RSC-04-R-O_20190524
 RG_STPD-RSC-05-R-O_20190524; RG_STPD-RSC-06-R-O_20190524
 RG_STPD-RSC-07-R-O_20190524; RG_ERWSF-RSC-01-R-O_20190524

Includes: LA-ICP-MS (line scans), data integration and calculations, Excel data, QA/QC results, chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalyticals Inc. method MET-002.01.

Analytical results are expressed in part per million (ppm) dry weight.

Samples quantified using DORM-4 certified reference standard.

*Sample bottle label (RG_STPD-RSC-01-R-O_20190515) was different than the COC label (RG_STPD-RSC-01-R-O_20190521).

COC form included on last page of report.

Moisture not requested.

This report provides the analytical results only for fish tissue samples noted above as received from the Client.

Reviewed and Approved by Jennie Christensen, PhD, RPBio

17 Jun 2019

Date

[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalyticals Inc.]



TrichAnalyticals Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalyticals.com

Nautilus Environmental Inc. Fish Ovary Tissue Analysis

| Sample ID | | RG_STPD-RSC-01-R-O_20190521* | RG_STPD-RSC-02-R-O_20190524 | RG_STPD-RSC-03-R-O_20190524 | RG_STPD-RSC-04-R-O_20190524 |
|-----------|----------|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.007 | 0.032 | 0.023 | 0.041 | 0.037 |
| 23Na | 3 | 3,924 | 2,638 | 2,917 | 2,773 |
| 24Mg | 0.04 | 1,873 | 1,667 | 1,975 | 2,204 |
| 27Al | 0.03 | 0.259 | 0.240 | 0.542 | 0.146 |
| 31P | 78 | 14,178 | 12,062 | 14,169 | 12,508 |
| 39K | 3 | 21,760 | 11,701 | 13,942 | 11,970 |
| 44Ca | 17 | 1,671 | 1,186 | 1,634 | 1,507 |
| 51V | 0.012 | 0.029 | 0.017 | 0.021 | 0.021 |
| 52Cr | 0.61 | 1.27 | 1.63 | 1.54 | 1.21 |
| 55Mn | 0.2 | 15.2 | 20.5 | 11.3 | 15.7 |
| 57Fe | 1.5 | 115 | 108 | 85.1 | 105 |
| 59Co | 0.024 | 0.110 | 0.110 | 0.136 | 0.100 |
| 60Ni | 0.008 | 0.084 | 0.573 | 0.216 | 0.043 |
| 63Cu | 0.004 | 4.94 | 5.60 | 6.33 | 5.35 |
| 66Zn | 0.032 | 180 | 152 | 190 | 174 |
| 75As | 0.229 | <0.229 | <0.229 | <0.229 | <0.229 |
| 77Se | 0.9 | 36.8 | 35.0 | 25.9 | 35.7 |
| 88Sr | 0.0004 | 0.677 | 0.559 | 0.835 | 0.669 |
| 95Mo | 0.002 | 0.207 | 0.104 | 0.162 | 0.172 |
| 111Cd | 0.034 | 1.24 | 0.900 | 1.10 | 1.32 |
| 118Sn | 0.042 | 0.222 | 0.135 | 0.343 | <0.042 |
| 202Hg | 0.016 | 0.166 | 0.119 | 0.138 | 0.178 |
| 208Pb | 0.001 | 0.011 | 0.005 | 0.009 | 0.003 |
| 238U | 0.00001 | 0.0010 | <0.00001 | 0.0005 | 0.0005 |

Notes:

ppm = parts per million

DL = detection limit

Nautilus Environmental Inc. Fish Ovary Tissue Analysis

| Sample ID | | RG_STPD-RSC-05-R-O_20190524 | RG_STPD-RSC-06-R-O_20190524 | RG_STPD-RSC-07-R-O_20190524 | RG_ERWSF-RSC-01-R-O_20190524 |
|-----------|----------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.007 | 0.058 | 0.035 | 0.060 | <0.007 |
| 23Na | 3 | 3,402 | 2,395 | 2,906 | 2,830 |
| 24Mg | 0.04 | 2,321 | 1,900 | 2,029 | 1,657 |
| 27Al | 0.03 | 0.617 | 0.653 | 1.93 | 0.836 |
| 31P | 78 | 13,563 | 13,306 | 11,715 | 12,303 |
| 39K | 3 | 16,343 | 12,145 | 13,649 | 13,380 |
| 44Ca | 17 | 1,924 | 1,449 | 1,482 | 1,290 |
| 51V | 0.012 | 0.035 | 0.029 | 0.089 | 0.024 |
| 52Cr | 0.61 | 1.44 | 1.45 | 2.43 | 1.19 |
| 55Mn | 0.2 | 27.2 | 17.5 | 23.0 | 13.1 |
| 57Fe | 1.5 | 115 | 71.6 | 95.4 | 82.9 |
| 59Co | 0.024 | 0.118 | 0.111 | 0.122 | 0.093 |
| 60Ni | 0.008 | 0.075 | 0.071 | 0.209 | 0.140 |
| 63Cu | 0.004 | 4.54 | 5.11 | 4.19 | 4.73 |
| 66Zn | 0.032 | 229 | 172 | 208 | 144 |
| 75As | 0.229 | <0.229 | <0.229 | <0.229 | <0.229 |
| 77Se | 0.9 | 30.5 | 27.8 | 42.4 | 16.9 |
| 88Sr | 0.0004 | 1.16 | 0.820 | 0.839 | 0.395 |
| 95Mo | 0.002 | 0.221 | 0.145 | 0.184 | 0.160 |
| 111Cd | 0.034 | 1.55 | 1.24 | 1.50 | 1.04 |
| 118Sn | 0.042 | 0.114 | 0.329 | 0.625 | 0.402 |
| 202Hg | 0.016 | 0.190 | 0.137 | 0.173 | 0.160 |
| 208Pb | 0.001 | 0.018 | 0.024 | 0.039 | 0.021 |
| 238U | 0.00001 | 0.0015 | 0.0019 | 0.0069 | 0.0005 |

Notes:

ppm = parts per million

DL = detection limit

Nautilus Environmental Inc. Fish Ovary Tissue QA-QC Relative Percent Difference Results

| Sample ID | | RG_STPD-RSC-04-R-O_20190524 | RG_STPD-RSC-04-R-O_20190524 (Duplicate) | RPD | RG_STPD-RSC-05-R-O_20190524 | RG_STPD-RSC-05-R-O_20190524 (Duplicate) | RPD |
|-----------|----------|-----------------------------|---|------|-----------------------------|---|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.007 | 0.037 | 0.029 | 22.9 | 0.058 | 0.053 | 9.4 |
| 23Na | 3 | 2,773 | 2,258 | 20.5 | 3,402 | 3,134 | 8.2 |
| 24Mg | 0.04 | 2,204 | 2,037 | 7.9 | 2,321 | 1,877 | 21.2 |
| 27Al | 0.03 | 0.146 | 0.180 | 21.2 | 0.617 | 0.641 | 3.9 |
| 31P | 78 | 12,508 | 10,650 | 16.1 | 13,563 | 13,367 | 1.5 |
| 39K | 3 | 11,970 | 10,279 | 15.2 | 16,343 | 14,753 | 10.2 |
| 44Ca | 17 | 1,507 | 1,811 | 18.4 | 1,924 | 1,793 | 7.1 |
| 51V | 0.012 | 0.021 | 0.013 | 47.4 | 0.035 | 0.027 | 25.4 |
| 52Cr | 0.61 | 1.21 | 1.19 | 1.5 | 1.44 | 1.27 | 13.0 |
| 55Mn | 0.2 | 15.7 | 15.8 | 0.8 | 27.2 | 24.0 | 12.5 |
| 57Fe | 1.5 | 105 | 96.0 | 9.4 | 115 | 91.0 | 23.6 |
| 59Co | 0.024 | 0.100 | 0.089 | 12.5 | 0.118 | 0.096 | 21.3 |
| 60Ni | 0.008 | 0.043 | 0.046 | 6.0 | 0.075 | 0.056 | 30.0 |
| 63Cu | 0.004 | 5.35 | 4.52 | 16.8 | 4.54 | 3.63 | 22.0 |
| 66Zn | 0.032 | 174 | 128 | 30.3 | 229 | 206 | 10.6 |
| 75As | 0.229 | <0.229 | <0.229 | - | <0.229 | <0.229 | - |
| 77Se | 0.9 | 35.7 | 33.2 | 7.1 | 30.5 | 34.7 | 13.0 |
| 88Sr | 0.0004 | 0.669 | 0.668 | 0.2 | 1.16 | 1.03 | 12.1 |
| 95Mo | 0.002 | 0.172 | 0.154 | 11.0 | 0.221 | 0.189 | 15.2 |
| 111Cd | 0.034 | 1.32 | 0.93 | 34.2 | 1.55 | 1.53 | 1.3 |
| 118Sn | 0.042 | <0.042 | 0.035 | - | 0.114 | 0.093 | 19.6 |
| 202Hg | 0.016 | 0.178 | 0.143 | 22.0 | 0.190 | 0.209 | 9.7 |
| 208Pb | 0.001 | 0.0028 | 0.0026 | 7.5 | 0.018 | 0.013 | 30.0 |
| 238U | 0.00001 | 0.0005 | <0.00001 | - | 0.0015 | 0.0014 | 3.1 |

Notes:

ppm = parts per million

RPD = Relative Percent Difference

% = percent

Nautilus Environmental Inc. Fish Ovary Tissue QA-QC Results

| Parameter | DORM-4 Conc. (ppm) | Actual Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
|-----------|-----------------------|-----------------------|--------------|----------------------|
| 7Li | 1.21 | 1.13 | 93.8 | 6.8 |
| 23Na | 14,000 | 14,334 | 102 | 5.1 |
| 24Mg | 910 | 866 | 95.2 | 3.5 |
| 27Al | 1,280 | 1,268 | 99.1 | 6.6 |
| 31P | 8,000 | 7,924 | 99.1 | 4.5 |
| 39K | 15,500 | 15,505 | 100 | 5.5 |
| 44Ca | 2,360 | 2,344 | 99.3 | 5.3 |
| 51V | 1.57 | 1.53 | 97.4 | 10.0 |
| 52Cr | 1.87 | 1.91 | 102 | 2.3 |
| 55Mn | 3.17 | 3.42 | 108 | 7.8 |
| 57Fe | 343 | 340 | 99.2 | 5.3 |
| 59Co | 0.250 | 0.241 | 96.2 | 5.7 |
| 60Ni | 1.34 | 1.23 | 92.1 | 2.2 |
| 63Cu | 15.7 | 14.9 | 95.1 | 5.9 |
| 66Zn | 51.6 | 52.6 | 102 | 7.8 |
| 75As | 6.87 | 6.89 | 100 | 5.2 |
| 77Se | 3.45 | 3.34 | 96.9 | 2.6 |
| 88Sr | 10.1 | 10.1 | 100 | 6.1 |
| 95Mo | 0.290 | 0.273 | 94.2 | 9.2 |
| 111Cd | 0.299 | 0.267 | 89.2 | 6.0 |
| 118Sn | 0.061 | 0.056 | 92.5 | 13.3 |
| 202Hg | 0.412 | 0.423 | 103 | 7.5 |
| 208Pb | 0.404 | 0.377 | 93.4 | 8.0 |
| 238U | 0.0500 | 0.0498 | 99.6 | 16.2 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

| | | | |
|--|------------------------------|--|---|
| TrichAnalytics Inc. 207-1753 Sean Heights, Saanichton, BC, V8M 0B3 Ph: (250) 532-1084 | | Chain of Custody (COC) for LA-ICP-MS Analysis | |
| Invoicing | | Reporting (if different from Invoicing) | |
| Project Number: RSC Toxicity Supporting Study | | | |
| Company Name: | Minnow Environmental | Company Name: | |
| Contact Name: | David Semeniuk | Contact Name: | |
| Address: | 2 Lamb Street | Address: | |
| City, Province: | Georgetown, ON | City, Province: | |
| Postal Code: | L7G 3M9 | Postal Code: | |
| Phone: | 778-229-1791 | Phone: | |
| Email: | dsemeniuk@minnow.ca | Email: | james@nautilusenvironmental.com; dsemeniuk@minnow.ca; sweech@minnow.ca; nigel.fisher@teck.com |
| Sample Analysis Requested | | | |
| Sample Identification: | | Sample Type: | |
| | | Species | Sample type |
| 1 | RG_STPD-RSC-01-R-O_20190521 | RSC | Unripe ovary |
| 2 | RG_STPD-RSC-02-R-O_20190524 | RSC | Unripe ovary |
| 3 | RG_STPD-RSC-03-R-O_20190524 | RSC | Unripe ovary |
| 4 | RG_STPD-RSC-04-R-O_20190524 | RSC | Unripe ovary |
| 5 | RG_STPD-RSC-05-R-O_20190524 | RSC | Unripe ovary |
| 6 | RG_STPD-RSC-06-R-O_20190524 | RSC | Unripe ovary |
| 7 | RG_STPD-RSC-07-R-O_20190524 | RSC | Unripe ovary |
| 8 | RG_ERWSF-RSC-01-R-O_20190524 | RSC | Unripe ovary |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| Sample(s) Released By: <i>Lisa Bawrow</i> | | Sample(s) Received By: <i>GERIENE LABINE</i> | |
| Signature: <i>Lisa Bawrow</i> | | Signature: <i>Gerienne Labine</i> | |
| Date Sent: <i>26 May 19</i> | | Date Received: <i>28 May 2019. (Project #: 2019-059)</i> | |
| Sample(s) Returned to Client By: | | Shipping Conditions: | |
| | | Shipping Container: | |
| Signature: | | Date Sent: | |



TrichAnalytics Inc.

Fish Ovary Tissue Microchemistry Analysis Report

Client:

James Elphick
Nautilus Environmental Inc.
8664 Commerce Court, Burnaby, BC
V8A 4N7
Ph: 250-216-8420
[Email: james@nautilusenvironmental.com](mailto:james@nautilusenvironmental.com)

Date Received:

06 Jun 2019

Report Date:

12 Jun 2019

Project No.

2019-062

Analytical Request: Fish Ovary Tissue Microchemistry (total metals and moisture) – 31 fish ovary tissue samples

See chain of custody form provided for sample identification numbers.

Includes: LA-ICP-MS (line scans), data integration and calculations, Excel data, QA-QC results.

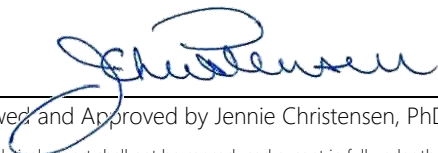
Notes:

Samples prepared and analyzed using TrichAnalytics Inc. method MET-002.01.

Analytical results are expressed in part per million (ppm) dry weight.

Samples quantified using DORM-4 certified reference standard.

This report provides the analytical results only for fish ovary tissue samples noted above as received from the Client.



Reviewed and Approved by Jennie Christensen, PhD, RPBio

12 Jun 2019

Date

[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalytics Inc.]



TrichAnalytics Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytics.com

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_LNLK-RSC-11-R-O_20190517 | RG_LNLK-RSC-12-R-O_20190517 | RG_LNLK-RSC-13-R-O_20190517 | RG_LNLK-RSC-14-R-O_20190520 | RG_LNLK-RSC-15-R-O_20190520 |
|----------------|----------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Wet Weight (g) | | 0.0487 | 0.1134 | 0.0839 | 0.0865 | 0.1777 |
| Moisture (%) | | 62.8 | 70.7 | 47.0 | 68.8 | 64.7 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | 0.121 | <0.020 | <0.020 | 0.036 | <0.020 |
| 23Na | 2.0 | 3165 | 2528 | 3415 | 3912 | 3365 |
| 24Mg | 0.050 | 1660 | 1390 | 1460 | 1606 | 1712 |
| 27Al | 0.100 | 6.04 | 0.799 | 0.910 | 4.32 | 0.960 |
| 31P | 40.0 | 11816 | 11679 | 13351 | 13570 | 13086 |
| 39K | 4.0 | 15433 | 12653 | 14023 | 14480 | 13258 |
| 44Ca | 94.0 | 1776 | 1016 | 1127 | 2779 | 1833 |
| 51V | 0.030 | 0.210 | <0.030 | <0.030 | 0.065 | 0.047 |
| 52Cr | 0.300 | 1.79 | 1.60 | 1.68 | 1.62 | 1.69 |
| 55Mn | 0.250 | 23.4 | 18.1 | 16.2 | 18.1 | 15.8 |
| 57Fe | 1.0 | 112 | 88.6 | 98.2 | 112 | 105 |
| 59Co | 0.010 | 0.189 | 0.082 | 0.077 | 0.125 | 0.116 |
| 60Ni | 0.010 | 1.11 | 0.854 | 0.430 | 0.821 | 0.317 |
| 63Cu | 0.005 | 5.75 | 3.50 | 5.47 | 3.81 | 5.59 |
| 66Zn | 0.600 | 158 | 162 | 231 | 129 | 204 |
| 75As | 0.300 | <0.300 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 1.53 | 1.47 | 1.81 | 1.71 | 2.11 |
| 88Sr | 0.020 | 1.05 | 0.410 | 0.457 | 1.97 | 0.792 |
| 95Mo | 0.005 | 0.275 | 0.139 | 0.095 | 0.195 | 0.153 |
| 111Cd | 0.030 | 1.43 | 0.818 | 1.27 | 0.797 | 1.23 |
| 118Sn | 0.010 | 0.108 | 0.075 | 0.180 | 0.060 | 0.066 |
| 202Hg | 0.020 | 0.175 | 0.124 | 0.162 | 0.151 | 0.223 |
| 208Pb | 0.001 | 0.200 | 0.008 | 0.007 | 0.051 | 0.007 |
| 238U | 0.0001 | 0.042 | 0.0005 | <0.0001 | 0.004 | 0.0011 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_LNLK-RSC-16-R-O_20190520 | RG_LNLK-RSC-17-R-O_20190520 | RG_LNLK-RSC-18-R-O_20190520 | RG_LNLK-RSC-19-R-O_20190520 | RG_LNLK-RSC-20-R-O_20190520 |
|----------------|----------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Wet Weight (g) | | 0.2535 | 0.0599 | 0.1673 | 0.0609 | 0.1668 |
| Moisture (%) | | 67.3 | 67.8 | 62.5 | 40.9 | 70.2 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.025 |
| 23Na | 2.0 | 3075 | 3226 | 2435 | 3410 | 3280 |
| 24Mg | 0.050 | 1384 | 1624 | 1243 | 1513 | 1547 |
| 27Al | 0.100 | 0.391 | 1.45 | 0.453 | 0.347 | 2.00 |
| 31P | 40.0 | 11809 | 12344 | 12500 | 11580 | 12448 |
| 39K | 4.0 | 11721 | 13636 | 11238 | 12125 | 11713 |
| 44Ca | 94.0 | 1118 | 1507 | 995 | 1048 | 1304 |
| 51V | 0.030 | 0.035 | 0.048 | <0.030 | <0.030 | 0.088 |
| 52Cr | 0.300 | 1.46 | 1.70 | 1.47 | 1.93 | 1.60 |
| 55Mn | 0.250 | 22.0 | 26.9 | 17.0 | 20.0 | 17.9 |
| 57Fe | 1.0 | 82.4 | 92.6 | 65.0 | 88.5 | 93.9 |
| 59Co | 0.010 | 0.062 | <0.010 | 0.053 | 0.113 | 0.096 |
| 60Ni | 0.010 | 0.162 | <0.010 | 0.166 | 0.848 | 0.396 |
| 63Cu | 0.005 | 6.08 | 4.90 | 3.87 | 5.28 | 5.22 |
| 66Zn | 0.600 | 135 | 217 | 140 | 193 | 175 |
| 75As | 0.300 | <0.300 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 1.78 | 2.57 | 1.77 | 1.59 | 2.00 |
| 88Sr | 0.020 | 0.446 | 0.413 | 0.389 | 0.498 | 0.714 |
| 95Mo | 0.005 | 0.170 | 0.214 | 0.103 | 0.094 | 0.177 |
| 111Cd | 0.030 | 0.715 | 1.27 | 0.708 | 0.990 | 0.987 |
| 118Sn | 0.010 | 0.024 | 0.225 | 0.112 | 0.092 | 0.194 |
| 202Hg | 0.020 | 0.106 | 0.168 | 0.114 | 0.117 | 0.147 |
| 208Pb | 0.001 | 0.005 | 0.012 | 0.012 | 0.006 | 0.029 |
| 238U | 0.0001 | <0.0001 | 0.0005 | <0.0001 | <0.0001 | 0.005 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ERIMF-RSC-04-R-O_20190515 | RG_ERIMF-RSC-05-R-O_20190517 | RG_ERIMF-RSC-06-R-O_20190521 | RG_ERIMF-RSC-07-R-O_20190523 | RG_ERIMF-RSC-08-R-O_20190523 |
|----------------|----------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Wet Weight (g) | | 0.1058 | 0.0809 | 0.0408 | 0.317 | 0.2075 |
| Moisture (%) | | 71.9 | 67.7 | 58.8 | 72.1 | 71.1 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | 0.069 | 0.031 | 0.089 | 0.030 | 0.058 |
| 23Na | 2.0 | 3758 | 3160 | 4142 | 3628 | 4425 |
| 24Mg | 0.050 | 1928 | 1643 | 2127 | 1772 | 2185 |
| 27Al | 0.100 | 4.01 | 0.593 | 4.26 | 1.63 | 2.82 |
| 31P | 40.0 | 14944 | 11065 | 15331 | 13425 | 14518 |
| 39K | 4.0 | 17905 | 13843 | 16873 | 13619 | 13917 |
| 44Ca | 94.0 | 2207 | 1411 | 1988 | 1723 | 2392 |
| 51V | 0.030 | 0.128 | 0.032 | 0.174 | 0.055 | 0.120 |
| 52Cr | 0.300 | 1.96 | 1.50 | 2.60 | 1.57 | 1.81 |
| 55Mn | 0.250 | 29.6 | 17.1 | 20.7 | 20.4 | 22.4 |
| 57Fe | 1.0 | 111 | 61.6 | 94.6 | 76.7 | 88.8 |
| 59Co | 0.010 | 0.186 | 0.102 | 0.208 | 0.135 | 0.164 |
| 60Ni | 0.010 | 0.748 | 0.750 | 2.25 | 0.252 | 0.430 |
| 63Cu | 0.005 | 4.54 | 5.36 | 3.33 | 3.58 | 5.99 |
| 66Zn | 0.600 | 193 | 201 | 214 | 151 | 182 |
| 75As | 0.300 | <0.300 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 9.70 | 7.89 | 4.69 | 5.75 | 14.4 |
| 88Sr | 0.020 | 1.16 | 0.645 | 1.24 | 0.890 | 1.30 |
| 95Mo | 0.005 | 0.385 | 0.146 | 0.281 | 0.154 | 0.266 |
| 111Cd | 0.030 | 1.19 | 1.21 | 1.33 | 0.824 | 1.05 |
| 118Sn | 0.010 | 0.141 | 0.054 | 0.200 | 0.129 | 0.341 |
| 202Hg | 0.020 | 0.164 | 0.173 | 0.169 | 0.119 | 0.165 |
| 208Pb | 0.001 | 0.086 | 0.004 | 0.125 | 0.017 | 0.081 |
| 238U | 0.0001 | 0.007 | 0.0006 | 0.025 | 0.002 | 0.011 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ERIMF-RSC-09-R-O_20190523 | RG_ERIMF-RSC-10-R-O_20190523 | RG_ERIMF-RSC-11-R-O_20190523 | RG_ERIMF-RSC-12-R-O_20190523 | RG_ERIMF-RSC-13-R-O_20190523 |
|----------------|----------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Wet Weight (g) | | 0.2077 | 0.0584 | 0.0169 | 0.0672 | 0.0298 |
| Moisture (%) | | 73.4 | 74.3 | 72.2 | 74.3 | 68.1 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | 0.257 | 0.055 | 0.026 | 0.094 | 0.025 |
| 23Na | 2.0 | 5773 | 3198 | 2707 | 3539 | 2762 |
| 24Mg | 0.050 | 2183 | 1772 | 1358 | 2129 | 1686 |
| 27Al | 0.100 | 7.38 | 4.98 | 4.14 | 12.5 | 9.47 |
| 31P | 40.0 | 14673 | 13481 | 11541 | 12762 | 12753 |
| 39K | 4.0 | 15531 | 14083 | 13072 | 13986 | 13904 |
| 44Ca | 94.0 | 3018 | 1558 | 1188 | 2931 | 1433 |
| 51V | 0.030 | 0.319 | 0.116 | 0.071 | 0.314 | 0.094 |
| 52Cr | 0.300 | 2.22 | 1.65 | 1.94 | 2.93 | 3.28 |
| 55Mn | 0.250 | 20.6 | 21.8 | 15.2 | 21.1 | 13.4 |
| 57Fe | 1.0 | 114 | 73.4 | 66.4 | 135 | 189 |
| 59Co | 0.010 | 0.248 | 0.141 | 0.150 | 0.306 | 0.206 |
| 60Ni | 0.010 | 1.30 | 0.836 | 1.41 | 3.18 | 3.32 |
| 63Cu | 0.005 | 5.60 | 3.43 | 2.33 | 5.00 | 4.58 |
| 66Zn | 0.600 | 197 | 132 | 137 | 153 | 166 |
| 75As | 0.300 | 0.333 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 10.3 | 9.07 | 10.2 | 8.50 | 5.01 |
| 88Sr | 0.020 | 2.35 | 0.932 | 0.562 | 1.68 | 0.646 |
| 95Mo | 0.005 | 0.385 | 0.232 | 0.166 | 0.323 | 0.210 |
| 111Cd | 0.030 | 2.78 | 0.726 | 0.848 | 1.20 | 0.889 |
| 118Sn | 0.010 | 0.265 | 0.085 | 0.051 | 0.106 | 0.075 |
| 202Hg | 0.020 | 0.155 | 0.134 | 0.126 | 0.147 | 0.120 |
| 208Pb | 0.001 | 0.279 | 0.080 | 0.036 | 0.152 | 0.013 |
| 238U | 0.0001 | 0.079 | 0.010 | 0.006 | 0.030 | 0.0006 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ERIMF-RSC-14-R-O_20190523 | RG_ERIMF-RSC-15-R-O_20190523 | RG_ERIMF-RSC-16-R-O_20190523 | RG_ERWSF-RSC-02-R-O_20190529 | RG_ERWSF-RSC-03-R-O_20190530 |
|----------------|----------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Wet Weight (g) | | 0.0698 | 0.034 | 0.0822 | 0.1323 | 0.1142 |
| Moisture (%) | | 74.8 | 29.1 | 72.5 | 72.1 | 72.4 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | 0.082 | 0.076 | 0.024 | <0.020 | <0.020 |
| 23Na | 2.0 | 3368 | 3619 | 3575 | 2857 | 2966 |
| 24Mg | 0.050 | 1938 | 2108 | 1840 | 2077 | 1869 |
| 27Al | 0.100 | 10.3 | 8.45 | 3.85 | 1.18 | 7.26 |
| 31P | 40.0 | 12370 | 15313 | 14177 | 13168 | 13827 |
| 39K | 4.0 | 15022 | 17583 | 16978 | 14541 | 15697 |
| 44Ca | 94.0 | 2220 | 2098 | 1821 | 1431 | 1336 |
| 51V | 0.030 | 0.212 | 0.165 | 0.064 | <0.030 | 0.082 |
| 52Cr | 0.300 | 2.59 | 2.95 | 2.35 | 1.50 | 3.54 |
| 55Mn | 0.250 | 25.6 | 27.0 | 18.1 | 19.8 | 17.8 |
| 57Fe | 1.0 | 134 | 123 | 141 | 103 | 150 |
| 59Co | 0.010 | 0.313 | 0.272 | 0.166 | 0.093 | 0.206 |
| 60Ni | 0.010 | 2.37 | 2.43 | 2.01 | 0.517 | 3.79 |
| 63Cu | 0.005 | 4.46 | 6.81 | 4.89 | 4.28 | 3.47 |
| 66Zn | 0.600 | 235 | 222 | 196 | 188 | 162 |
| 75As | 0.300 | <0.300 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 23.2 | 8.42 | 8.49 | 12.9 | 14.3 |
| 88Sr | 0.020 | 1.15 | 0.933 | 0.933 | 0.348 | 0.450 |
| 95Mo | 0.005 | 0.261 | 0.353 | 0.211 | 0.204 | 0.153 |
| 111Cd | 0.030 | 1.72 | 1.50 | 1.21 | 1.18 | 0.965 |
| 118Sn | 0.010 | 0.094 | 0.054 | 0.087 | 0.031 | 0.167 |
| 202Hg | 0.020 | 0.186 | 0.242 | 0.190 | 0.187 | 0.162 |
| 208Pb | 0.001 | 0.176 | 0.084 | 0.012 | 0.006 | 0.028 |
| 238U | 0.0001 | 0.015 | 0.038 | 0.0011 | <0.0001 | 0.0006 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_STPD-RSC-08-R-O_20190530 | RG_STPD-RSC-09-R-O_20190530 | RG_STPD-RSC-10-R-O_20190530 | RG_STPD-RSC-11-R-O_20190531 | RG_STPD-RSC-12-R-O_20190531 |
|----------------|----------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Wet Weight (g) | | 0.0819 | 0.0626 | 0.224 | 0.0976 | 0.0623 |
| Moisture (%) | | 66.2 | 65.0 | 70.0 | 69.6 | 62.0 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.020 | 0.038 | 0.060 | 0.040 | 0.035 | 0.048 |
| 23Na | 2.0 | 3159 | 2189 | 2848 | 3146 | 3077 |
| 24Mg | 0.050 | 2038 | 1556 | 1674 | 1706 | 1885 |
| 27Al | 0.100 | 3.18 | 5.26 | 1.38 | 1.69 | 5.48 |
| 31P | 40.0 | 13774 | 13794 | 12429 | 11784 | 14476 |
| 39K | 4.0 | 16447 | 12394 | 11234 | 13117 | 17485 |
| 44Ca | 94.0 | 1782 | 1167 | 1462 | 1372 | 1773 |
| 51V | 0.030 | 0.065 | 0.103 | <0.030 | 0.034 | 0.063 |
| 52Cr | 0.300 | 2.88 | 2.42 | 1.49 | 2.12 | 2.75 |
| 55Mn | 0.250 | 17.9 | 13.6 | 16.7 | 12.5 | 17.0 |
| 57Fe | 1.0 | 140 | 97.7 | 88.1 | 116 | 125 |
| 59Co | 0.010 | 0.188 | 0.153 | 0.066 | 0.136 | 0.159 |
| 60Ni | 0.010 | 2.65 | 1.71 | 0.235 | 1.58 | 2.31 |
| 63Cu | 0.005 | 5.02 | 5.02 | 5.60 | 4.31 | 5.47 |
| 66Zn | 0.600 | 185 | 112 | 164 | 163 | 186 |
| 75As | 0.300 | <0.300 | <0.300 | <0.300 | <0.300 | <0.300 |
| 77Se | 0.200 | 36.6 | 30.4 | 33.1 | 35.0 | 35.4 |
| 88Sr | 0.020 | 1.11 | 0.911 | 0.971 | 0.658 | 0.927 |
| 95Mo | 0.005 | 0.146 | 0.124 | 0.140 | 0.145 | 0.218 |
| 111Cd | 0.030 | 1.112 | 0.649 | 0.814 | 0.981 | 1.08 |
| 118Sn | 0.010 | 0.039 | 0.222 | 0.083 | 0.081 | 0.029 |
| 202Hg | 0.020 | 0.174 | 0.091 | 0.091 | 0.149 | 0.157 |
| 208Pb | 0.001 | 0.031 | 0.093 | 0.011 | 0.009 | 0.019 |
| 238U | 0.0001 | 0.0011 | 0.010 | 0.0005 | 0.0006 | 0.0011 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| | | |
|----------------|----------|-----------------------------|
| Sample ID | | RG_STPD-RSC-13-R-O_20190531 |
| Wet Weight (g) | | 0.1059 |
| Moisture (%) | | 69.0 |
| Parameter | DL (ppm) | (ppm) |
| 7Li | 0.020 | 0.058 |
| 23Na | 2.0 | 2971 |
| 24Mg | 0.050 | 2078 |
| 27Al | 0.100 | 2.82 |
| 31P | 40.0 | 13668 |
| 39K | 4.0 | 16660 |
| 44Ca | 94.0 | 1713 |
| 51V | 0.030 | 0.042 |
| 52Cr | 0.300 | 1.45 |
| 55Mn | 0.250 | 17.8 |
| 57Fe | 1.0 | 119 |
| 59Co | 0.010 | 0.145 |
| 60Ni | 0.010 | 0.552 |
| 63Cu | 0.005 | 5.21 |
| 66Zn | 0.600 | 190 |
| 75As | 0.300 | <0.300 |
| 77Se | 0.200 | 43.0 |
| 88Sr | 0.020 | 1.15 |
| 95Mo | 0.005 | 0.196 |
| 111Cd | 0.030 | 1.20 |
| 118Sn | 0.010 | 0.066 |
| 202Hg | 0.020 | 0.179 |
| 208Pb | 0.001 | 0.015 |
| 238U | 0.0001 | 0.0011 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_LNLK-RSC-15-R-O_20190520 | RG_LNLK-RSC-15-R-O_20190520 (Duplicate) | RPD | RG_LNLK-RSC-16-R-O_20190520 | RG_LNLK-RSC-16-R-O_20190520 (Duplicate) | RPD |
|-----------|----------|-----------------------------|---|------|-----------------------------|---|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.020 | <0.020 | <0.020 | - | <0.020 | <0.020 | - |
| 23Na | 2.0 | 3365 | 3734 | 10.4 | 3075 | 2675 | 13.9 |
| 24Mg | 0.050 | 1712 | 1539 | 10.6 | 1384 | 1238 | 11.1 |
| 27Al | 0.100 | 0.960 | 0.687 | 33.2 | 0.391 | 0.271 | 36.0 |
| 31P | 40.0 | 13086 | 12747 | 2.6 | 11809 | 10195 | 14.7 |
| 39K | 4.0 | 13258 | 14388 | 8.2 | 11721 | 10472 | 11.3 |
| 44Ca | 94.0 | 1833 | 1765 | 3.8 | 1118 | 981 | 13.0 |
| 51V | 0.030 | 0.047 | 0.057 | 19.4 | 0.035 | <0.030 | - |
| 52Cr | 0.300 | 1.69 | 1.61 | 5.0 | 1.46 | 1.29 | 12.4 |
| 55Mn | 0.250 | 15.8 | 13.6 | 14.9 | 22.0 | 19.7 | 11.0 |
| 57Fe | 1.0 | 105 | 95.9 | 9.1 | 82.4 | 76.2 | 7.7 |
| 59Co | 0.010 | 0.116 | 0.110 | 5.3 | 0.062 | 0.049 | 22.7 |
| 60Ni | 0.010 | 0.317 | 0.206 | 42.8 | 0.162 | 0.118 | 31.5 |
| 63Cu | 0.005 | 5.59 | 5.39 | 3.7 | 6.08 | 5.25 | 14.7 |
| 66Zn | 0.600 | 204 | 189 | 7.2 | 135 | 115 | 15.7 |
| 75As | 0.300 | <0.300 | <0.300 | - | <0.300 | <0.300 | - |
| 77Se | 0.200 | 1.85 | 1.25 | 38.5 | 1.67 | 1.30 | 24.6 |
| 88Sr | 0.020 | 0.792 | 0.714 | 10.3 | 0.446 | 0.383 | 15.3 |
| 95Mo | 0.005 | 0.153 | 0.146 | 4.3 | 0.170 | 0.147 | 14.3 |
| 111Cd | 0.030 | 1.23 | 1.00 | 20.4 | 0.715 | 0.557 | 24.8 |
| 118Sn | 0.010 | 0.066 | 0.078 | 16.1 | 0.024 | 0.024 | 0.3 |
| 202Hg | 0.020 | 0.223 | 0.181 | 21.0 | 0.106 | 0.083 | 24.8 |
| 208Pb | 0.0010 | 0.0074 | 0.0075 | 0.5 | 0.005 | 0.003 | 37.3 |
| 238U | 0.0001 | 0.0011 | 0.0011 | 0.0 | <0.0001 | <0.0001 | - |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_LNLK-RSC-18-R-O_20190520 | RG_LNLK-RSC-18-R-O_20190520 (Duplicate) | RPD | RG_ERIMF-RSC-07-R-O_20190523 | RG_ERIMF-RSC-07-R-O_20190523 (Duplicate) | RPD |
|-----------|----------|-----------------------------|---|------|------------------------------|--|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.020 | <0.020 | <0.020 | - | 0.030 | 0.023 | 25.8 |
| 23Na | 2.0 | 2435 | 2036 | 17.8 | 3628 | 2944 | 20.8 |
| 24Mg | 0.050 | 1243 | 1142 | 8.5 | 1772 | 1518 | 15.4 |
| 27Al | 0.100 | 0.453 | 0.466 | 2.9 | 1.63 | 1.53 | 6.8 |
| 31P | 40.0 | 12500 | 10698 | 15.5 | 13425 | 11703 | 13.7 |
| 39K | 4.0 | 11238 | 9373 | 18.1 | 13619 | 11439 | 17.4 |
| 44Ca | 94.0 | 995 | 927 | 7.1 | 1723 | 1385 | 21.8 |
| 51V | 0.030 | <0.030 | <0.030 | - | 0.055 | 0.048 | 13.9 |
| 52Cr | 0.300 | 1.47 | 1.37 | 7.1 | 1.57 | 1.49 | 5.2 |
| 55Mn | 0.250 | 17.0 | 15.5 | 9.3 | 20.4 | 17.4 | 15.8 |
| 57Fe | 1.0 | 65.0 | 55.5 | 15.8 | 76.7 | 64.0 | 17.9 |
| 59Co | 0.010 | 0.053 | 0.041 | 25.3 | 0.135 | 0.112 | 18.4 |
| 60Ni | 0.010 | 0.166 | 0.155 | 7.0 | 0.252 | 0.354 | 33.5 |
| 63Cu | 0.005 | 3.87 | 3.6 | 8.1 | 3.58 | 2.96 | 19.0 |
| 66Zn | 0.600 | 140 | 125 | 11.3 | 151 | 125 | 18.4 |
| 75As | 0.300 | <0.300 | <0.300 | - | <0.300 | <0.300 | - |
| 77Se | 0.200 | 1.70 | 1.52 | 11.6 | 5.66 | 4.33 | 26.7 |
| 88Sr | 0.020 | 0.389 | 0.354 | 9.5 | 0.890 | 0.753 | 16.6 |
| 95Mo | 0.005 | 0.103 | 0.094 | 9.1 | 0.154 | 0.115 | 28.7 |
| 111Cd | 0.030 | 0.708 | 0.588 | 18.4 | 0.824 | 0.665 | 21.3 |
| 118Sn | 0.010 | 0.112 | 0.095 | 15.9 | 0.129 | 0.077 | 50.6 |
| 202Hg | 0.020 | 0.114 | 0.094 | 19.4 | 0.119 | 0.093 | 23.9 |
| 208Pb | 0.0010 | 0.012 | 0.009 | 30.1 | 0.017 | 0.013 | 26.2 |
| 238U | 0.0001 | <0.0001 | <0.0001 | - | 0.0022 | 0.0016 | 28.6 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_STPD-RSC-10-R-O_20190530 | RG_STPD-RSC-10-R-O_20190530 (Duplicate) | RPD |
|-----------|----------|-----------------------------|---|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) |
| 7Li | 0.020 | 0.040 | 0.031 | 25.6 |
| 23Na | 2.0 | 2848 | 2435 | 15.6 |
| 24Mg | 0.050 | 1674 | 1413 | 16.9 |
| 27Al | 0.100 | 1.38 | 1.19 | 14.6 |
| 31P | 40.0 | 12429 | 11566 | 7.2 |
| 39K | 4.0 | 11234 | 10163 | 10.0 |
| 44Ca | 94.0 | 1462 | 1242 | 16.2 |
| 51V | 0.030 | <0.030 | <0.030 | - |
| 52Cr | 0.300 | 1.49 | 1.43 | 4.0 |
| 55Mn | 0.250 | 16.7 | 13.8 | 18.9 |
| 57Fe | 1.0 | 88.1 | 71.9 | 20.2 |
| 59Co | 0.010 | 0.066 | 0.053 | 21.2 |
| 60Ni | 0.010 | 0.235 | 0.219 | 6.9 |
| 63Cu | 0.005 | 5.60 | 4.46 | 22.7 |
| 66Zn | 0.600 | 164 | 124 | 27.6 |
| 75As | 0.300 | <0.300 | <0.300 | - |
| 77Se | 0.200 | 33.3 | 28.8 | 14.6 |
| 88Sr | 0.020 | 0.971 | 0.785 | 21.2 |
| 95Mo | 0.005 | 0.140 | 0.117 | 17.3 |
| 111Cd | 0.030 | 0.814 | 0.637 | 24.3 |
| 118Sn | 0.010 | 0.083 | 0.073 | 12.9 |
| 202Hg | 0.020 | 0.091 | 0.074 | 21.0 |
| 208Pb | 0.0010 | 0.011 | 0.008 | 29.9 |
| 238U | 0.0001 | 0.0005 | 0.0005 | 0.0 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Accuracy and Precision Results

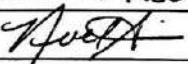
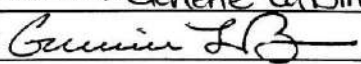
| Parameter | DORM-4 Conc. (ppm) | Set I | | | Set II | | |
|-----------|-----------------------|-----------------------|--------------|----------------------|-----------------------|--------------|----------------------|
| | | Actual Conc. (ppm) | Accuracy (%) | Precision RSD (%) | Actual Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 1.21 | 1.12 | 108 | 12.0 | 1.12 | 108 | 7.0 |
| 23Na | 14000 | 13302 | 105 | 9.3 | 13222 | 106 | 4.5 |
| 24Mg | 910 | 882 | 103 | 9.8 | 835 | 109 | 12.8 |
| 27Al | 1280 | 991 | 129 | 22.0 | 1190 | 108 | 13.1 |
| 31P | 8000 | 7446 | 107 | 6.6 | 7308 | 109 | 3.8 |
| 39K | 15500 | 15214 | 102 | 5.4 | 13792 | 112 | 3.8 |
| 44Ca | 2360 | 2245 | 105 | 5.3 | 2103 | 112 | 4.1 |
| 51V | 1.57 | 1.26 | 125 | 16.5 | 1.49 | 106 | 9.3 |
| 52Cr | 1.87 | 1.65 | 113 | 7.1 | 1.80 | 104 | 3.4 |
| 55Mn | 3.17 | 2.88 | 110 | 10.8 | 2.81 | 113 | 8.3 |
| 57Fe | 343 | 297 | 116 | 5.9 | 294 | 117 | 7.3 |
| 59Co | 0.250 | 0.204 | 123 | 6.1 | 0.218 | 115 | 3.6 |
| 60Ni | 1.34 | 1.11 | 121 | 12.6 | 1.10 | 121 | 4.3 |
| 63Cu | 15.7 | 12.3 | 127 | 6.1 | 13.3 | 118 | 3.4 |
| 66Zn | 51.6 | 44.1 | 117 | 5.3 | 43.3 | 119 | 4.0 |
| 75As | 6.87 | 5.75 | 120 | 7.3 | 6.43 | 107 | 2.6 |
| 77Se | 3.45 | 2.89 | 120 | 5.7 | 3.13 | 110 | 3.8 |
| 88Sr | 10.1 | 9.75 | 104 | 15.9 | 9.24 | 109 | 2.5 |
| 95Mo | 0.290 | 0.246 | 118 | 4.8 | 0.251 | 115 | 2.5 |
| 111Cd | 0.299 | 0.211 | 141 | 6.8 | 0.215 | 139 | 7.1 |
| 118Sn | 0.061 | 0.048 | 127 | 41.4 | 0.054 | 113 | 8.3 |
| 202Hg | 0.412 | 0.308 | 134 | 4.5 | 0.340 | 121 | 8.8 |
| 208Pb | 0.404 | 0.374 | 108 | 22.8 | 0.353 | 114 | 8.4 |
| 238U | 0.050 | 0.040 | 126 | 19.3 | 0.037 | 134 | 9.7 |

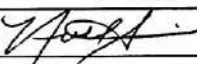
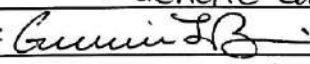
Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

| | | | |
|--|--|---|---|
| TrichAnalytics Inc. 207-1753 Sean Heights, Saanichton, BC, V8M 0B3 Ph: (250) 532-1084 | | Chain of Custody (COC) for LA-ICP-MS Analysis | |
| Invoicing | | Reporting (if different from Invoicing) | |
| Project Number: RSC Toxicity Supporting Study | | | |
| Company Name: | Minnow Environmental | Company Name: | |
| Contact Name: | David Semeniuk | Contact Name: | |
| Address: | 2 Lamb Street | Address: | |
| City, Province: | Georgetown, ON | City, Province: | |
| Postal Code: | L7G 3M9 | Postal Code: | |
| Phone: | 778-229-1791 | Phone: | |
| Email: | Dsemeniuk@minnow.ca | Email: | james@nautilusenvironmental.com ; dsemeniuk@minnow.ca ; sweech@minnow.ca ; nigel.fisher@teck.com |
| Sample Analysis Requested | | | |
| Sample Identification: | | Sample Type: | |
| SAMPLE ID #: | | Species | Sample type |
| #1 | 1 RG_LNLK-RSC-11-R-O_20190517 | RSC | Unripe ovary |
| #2 | 2 RG_LNLK-RSC-12-R-O_20190517 | RSC | Unripe ovary |
| #3 | 3 RG_LNLK-RSC-13-R-O_20190517 | RSC | Unripe ovary |
| #4 | 4 RG_LNLK-RSC-14-R-O_20190520 | RSC | Unripe ovary |
| #5 | 5 RG_LNLK-RSC-15-R-O_20190520 | RSC | Unripe ovary |
| #6 | 6 RG_LNLK-RSC-16-R-O_20190520 | RSC | Unripe ovary |
| #7 | 7 RG_LNLK-RSC-17-R-O_20190520 | RSC | Unripe ovary |
| #8 | 8 RG_LNLK-RSC-18-R-O_20190520 | RSC | Unripe ovary |
| #9 | 9 RG_LNLK-RSC-19-R-O_20190520 | RSC | Unripe ovary |
| #10 | 10 RG_LNLK-RSC-20-R-O_20190520 | RSC | Unripe ovary |
| #11 | 11 RG_ERIMF-RSC-04-R-O_20190515 | RSC | Unripe ovary |
| #12 | 12 RG_ERIMF-RSC-05-R-O_20190517 | RSC | Unripe ovary |
| #13 | 13 RG_ERIMF-RSC-06-R-O_20190521 | RSC | Unripe ovary |
| #14 | 14 RG_ERIMF-RSC-07-R-O_20190523 | RSC | Unripe ovary |
| Sample(s) Released By: Noel Soogrim | | Sample(s) Received By: Genene LaBine | |
| Signature:  | | Signature:  | |
| Date Sent: 5-JUN-19 | | Date Received: 06 JUN 2019 (Project #: 2019-062) | |
| Sample(s) Returned to Client By: | | Shipping Conditions: | |
| | | Shipping Container: | |
| Signature: | | Date Sent: | |

| | | | | |
|--|------------------------|---|---|--------------|
| TrichAnalytics Inc. 207-1753 Sean Heights, Saanichton, BC, V8M 0B3 Ph: (250) 532-1084 | | Chain of Custody (COC) for LA-ICP-MS Analysis | | |
| Invoicing | | Reporting (if different from Invoicing) | | |
| Project Number: RSC Toxicity Supporting Study | | | | |
| Company Name: | Minnow Environmental | Company Name: | | |
| Contact Name: | David Semeniuk | Contact Name: | | |
| Address: | 2 Lamb Street | Address: | | |
| City, Province: | Georgetown, ON | City, Province: | | |
| Postal Code: | L7G 3M9 | Postal Code: | | |
| Phone: | 778-229-1791 | Phone: | | |
| Email: | dsemeniuk@minnow.ca | Email: | james@nautiusenvironmental.com; dsemeniuk@minnow.ca, sweech@minnow.ca, niel.fisher@teck.com | |
| Sample Analysis Requested | | | | |
| Sample ID# | Sample Identification: | | Sample Type: | |
| | | | Species | Sample type |
| #15 | 1 | RG_ERIMF-RSC-08-R-O_20190523 | RSC | Unripe ovary |
| #16 | 2 | RG_ERIMF-RSC-09-R-O_20190523 | RSC | Unripe ovary |
| #17 | 3 | RG_ERIMF-RSC-10-R-O_20190523 | RSC | Unripe ovary |
| #18 | 4 | RG_ERIMF-RSC-11-R-O_20190523 | RSC | Unripe ovary |
| #19 | 5 | RG_ERIMF-RSC-12-R-O_20190523 | RSC | Unripe ovary |
| #20 | 6 | RG_ERIMF-RSC-13-R-O_20190523 | RSC | Unripe ovary |
| #21 | 7 | RG_ERIMF-RSC-14-R-O_20190523 | RSC | Unripe ovary |
| #22 | 8 | RG_ERIMF-RSC-15-R-O_20190523 | RSC | Unripe ovary |
| #23 | 9 | RG_ERIMF-RSC-16-R-O_20190523 | RSC | Unripe ovary |
| #24 | 10 | RG_ERWSF-RSC-02-R-O_20190529 | RSC | Unripe ovary |
| #25 | 11 | RG_ERWSF-RSC-03-R-O_20190530 | RSC | Unripe ovary |
| #26 | 12 | RG_STPD-RSC-08-R-O_20190530 | RSC | Unripe ovary |
| #27 | 13 | RG_STPD-RSC-09-R-O_20190530 | RSC | Unripe ovary |
| #28 | 14 | RG_STPD-RSC-10-R-O_20190530 | RSC | Unripe ovary |
| #29 | 15 | RG_STPD-RSC-11-R-O_20190531 | RSC | Unripe ovary |
| #30 | 16 | RG_STPD-RSC-12-R-O_20190531 | RSC | Unripe ovary |
| #31 | 17 | RG_STPD-RSC-13-R-O_20190531 | RSC | Unripe ovary |
| | 18 | | | |
| | 19 | | | |
| | 20 | | | |
| Sample(s) Released By: Noel Soogrim | | Sample(s) Received By: Genevieve LaBine | | |
| Signature:  | | Signature:  | | |
| Date Sent: 5-JUN-19 | | Date Received: 06 JUN 2019 (PROJECT #: 2019-062) | | |
| Sample(s) Returned to Client By: | | Shipping Conditions: | | |
| | | Shipping Container: | | |
| Signature: | | Date Sent: | | |



TrichAnalytics Inc.

Fish Ovary Tissue Microchemistry Analysis Report

Client:

James Elphick
Nautilus Environmental Inc.
8664 Commerce Court, Burnaby, BC
V8A 4N7
Ph: 250-216-8420
[Email: james@nautilusenvironmental.com](mailto:james@nautilusenvironmental.com)

Date Received:

19 Jun 2019

Report Date:

21 Jun 2019

Project No.

2019-062

Analytical Request: Fish Ovary Tissue Microchemistry (total metals and moisture) – 2 fish ovary tissue samples

Sample IDs: RG_ER_RSC-01-R-O_20190613 and RG_ER_RSC-02-R-O_20190613

Includes: LA-ICP-MS (line scans), data integration and calculations, Excel data, QA-QC results, chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalytics Inc. method MET-002.01.

Analytical results are expressed in part per million (ppm) dry weight.

Samples quantified using DORM-4 certified reference standard.

This report provides the analytical results only for fish ovary tissue samples noted above as received from the Client.

Reviewed and Approved by Jennie Christensen, PhD, RPBio

21 Jun 2019

Date

[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalytics Inc.]



TrichAnalytics Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytics.com

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ER_RSC-01-R- O_20190613 | RG_ER_RSC-02-R- O_20190613 |
|----------------|----------|-------------------------------|-------------------------------|
| Wet Weight (g) | | 0.2694 | 0.2173 |
| Moisture (%) | | 73.2 | 70.5 |
| Parameter | DL (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.044 | 0.019 |
| 23Na | 1 | 4,339 | 4,215 |
| 24Mg | 0.03 | 1,655 | 1,496 |
| 27Al | 0.02 | 2.99 | 1.05 |
| 31P | 48 | 14,467 | 14,643 |
| 39K | 4 | 16,593 | 15,788 |
| 44Ca | 10 | 2,200 | 1,381 |
| 51V | 0.015 | 0.108 | 0.030 |
| 52Cr | 0.09 | 1.62 | 1.69 |
| 55Mn | 0.01 | 22.2 | 16.1 |
| 57Fe | 0.7 | 153 | 140 |
| 59Co | 0.007 | 0.144 | 0.093 |
| 60Ni | 0.008 | 0.336 | 0.484 |
| 63Cu | 0.006 | 6.49 | 5.57 |
| 66Zn | 0.06 | 225 | 206 |
| 75As | 0.262 | <0.262 | <0.262 |
| 77Se | 0.2 | 24.4 | 16.8 |
| 88Sr | 0.001 | 1.18 | 0.724 |
| 95Mo | 0.002 | 0.251 | 0.175 |
| 111Cd | 0.03 | 2.25 | 1.49 |
| 118Sn | 0.007 | 0.160 | 0.050 |
| 202Hg | 0.010 | 0.275 | 0.129 |
| 208Pb | 0.001 | 0.099 | 0.007 |
| 238U | 0.0001 | 0.012 | 0.001 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_ER_RSC-01-R- O_20190613 | RG_ER_RSC-01-R- O_20190613 (Duplicate) | RPD | RG_ER_RSC-02-R- O_20190613 | RG_ER_RSC-02-R- O_20190613 (Duplicate) | RPD |
|-----------|----------|-------------------------------|--|------|-------------------------------|--|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.005 | 0.044 | 0.051 | 14.1 | 0.019 | 0.020 | 7.1 |
| 23Na | 1 | 4,339 | 4,613 | 6.1 | 4,215 | 4,119 | 2.3 |
| 24Mg | 0.03 | 1,655 | 1,580 | 4.7 | 1,496 | 1,530 | 2.3 |
| 27Al | 0.02 | 2.99 | 3.49 | 15.4 | 1.05 | 1.29 | 19.8 |
| 31P | 48 | 14,467 | 14,305 | 1.1 | 14,643 | 14,320 | 2.2 |
| 39K | 4 | 16,593 | 18,048 | 8.4 | 15,788 | 15,345 | 2.8 |
| 44Ca | 10 | 2,200 | 2,129 | 3.3 | 1,381 | 1,404 | 1.7 |
| 51V | 0.015 | 0.108 | 0.112 | 3.5 | 0.030 | 0.040 | 27.0 |
| 52Cr | 0.09 | 1.62 | 1.69 | 4.1 | 1.69 | 1.81 | 6.8 |
| 55Mn | 0.01 | 22.2 | 21.5 | 3.3 | 16.1 | 16.6 | 3.5 |
| 57Fe | 0.7 | 153 | 146 | 4.5 | 140 | 134 | 3.9 |
| 59Co | 0.007 | 0.144 | 0.145 | 0.6 | 0.093 | 0.103 | 10.4 |
| 60Ni | 0.008 | 0.336 | 0.447 | 28.3 | 0.484 | 0.601 | 21.6 |
| 63Cu | 0.006 | 6.49 | 6.39 | 1.5 | 5.57 | 5.64 | 1.2 |
| 66Zn | 0.06 | 225 | 225 | 0.0 | 206 | 212 | 2.7 |
| 75As | 0.262 | <0.262 | <0.262 | - | <0.262 | <0.262 | - |
| 77Se | 0.2 | 24.4 | 24.3 | 0.2 | 16.8 | 17.6 | 4.9 |
| 88Sr | 0.001 | 1.18 | 1.22 | 3.2 | 0.724 | 0.777 | 7.0 |
| 95Mo | 0.002 | 0.251 | 0.253 | 1.1 | 0.175 | 0.184 | 5.3 |
| 111Cd | 0.03 | 2.25 | 2.36 | 4.7 | 1.49 | 1.51 | 1.3 |
| 118Sn | 0.007 | 0.160 | 0.166 | 3.6 | 0.050 | 0.064 | 24.7 |
| 202Hg | 0.010 | 0.275 | 0.257 | 6.5 | 0.129 | 0.138 | 6.9 |
| 208Pb | 0.001 | 0.099 | 0.126 | 23.4 | 0.007 | 0.014 | 50.0 |
| 238U | 0.0001 | 0.0123 | 0.0167 | 30.5 | 0.0010 | 0.0012 | 22.2 |

Notes:

ppm = parts per million

RPD = Relative Percent Difference

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Accuracy and Precision Results

| Parameter | DORM-4 Conc. (ppm) | Actual Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
|-----------|-----------------------|-----------------------|--------------|----------------------|
| 7Li | 1.21 | 1.44 | 119 | 2.4 |
| 23Na | 14,000 | 17,113 | 122 | 1.0 |
| 24Mg | 910 | 1082 | 119 | 3.3 |
| 27Al | 1,280 | 1,625 | 127 | 8.3 |
| 31P | 8,000 | 9,512 | 119 | 2.0 |
| 39K | 15,500 | 17,597 | 114 | 1.5 |
| 44Ca | 2,360 | 2,598 | 110 | 3.1 |
| 51V | 1.57 | 1.88 | 120 | 5.1 |
| 52Cr | 1.87 | 2.22 | 119 | 3.4 |
| 55Mn | 3.17 | 3.90 | 123 | 6.7 |
| 57Fe | 343 | 423 | 123 | 4.9 |
| 59Co | 0.250 | 0.311 | 124 | 4.6 |
| 60Ni | 1.34 | 1.63 | 122 | 4.7 |
| 63Cu | 15.7 | 20.3 | 130 | 5.1 |
| 66Zn | 51.6 | 59.9 | 116 | 5.3 |
| 75As | 6.87 | 8.24 | 120 | 2.2 |
| 77Se | 3.45 | 3.89 | 113 | 3.5 |
| 88Sr | 10.1 | 11.3 | 112 | 5.4 |
| 95Mo | 0.290 | 0.323 | 111 | 4.1 |
| 111Cd | 0.299 | 0.392 | 131 | 6.2 |
| 118Sn | 0.061 | 0.068 | 111 | 15 |
| 202Hg | 0.412 | 0.482 | 117 | 4.8 |
| 208Pb | 0.404 | 0.467 | 115 | 7.3 |
| 238U | 0.050 | 0.051 | 102 | 14 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

| | | | |
|--|---------------------------------|--|---|
| TrichAnalytics Inc. 207-1753 Sean Heights, Saanichton, BC, V8M 0B3 Ph: (250) 532-1084 | | Chain of Custody (COC) for LA-ICP-MS Analysis | |
| Invoicing | | Reporting (if different from Invoicing) | |
| Project Number: RSC Toxicity Supporting Study | | | |
| Company Name: | Nautilus Environmental | Company Name: | |
| Contact Name: | James Elphick | Contact Name: | |
| Address: | 8664 Commerce Court | Address: | |
| City, Province: | Burnaby, BC | City, Province: | |
| Postal Code: | V5A 4N7 | Postal Code: | |
| Phone: | 1-250-216-8420 | Phone: | |
| Email: | james@nautilusenvironmental.com | Email: | james@nautilusenvironmental.com, dsemeniuk@minnow.ca, sweech@minnow.ca, nigel.fisher@teck.com |
| Sample Analysis Requested | | | |
| Sample Identification: | | Sample Type: | |
| | | Species | Sample type |
| 1 | RG_ER_RSC-01-R-O_20190613 | RSC | Unripe ovary |
| 2 | RG_ER-RSC-02-R-O_20190613 | RSC | Unripe ovary |
| 3 | | | |
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| 19 | | | |
| 20 | | | |
| Sample(s) Released By: David Semeniuk | | Sample(s) Received By: <i>Guillaume LaBine</i> | |
| Signature: <i>David Semeniuk</i> | | Signature: <i>GUILLAUME LABINE</i> | |
| Date Sent: 18-Jun-19 | | Date Received: 20 JUN 2019 (PROJECT #: 2019-062) | |
| Sample(s) Returned to Client By: NOTE: page 1 of 2 | | Shipping Conditions: | |
| | | Shipping Container: | |
| Signature: | | Date Sent: | |



TrichAnalytics Inc.

Fish Ovary Tissue Microchemistry Analysis Report

Client:

James Elphick
Nautilus Environmental Inc.
8664 Commerce Court, Burnaby, BC
V8A 4N7
Ph: 250-216-8420
[Email: james@nautilusenvironmental.com](mailto:james@nautilusenvironmental.com)

Date Received:

14 Jun 2019

Report Date:

17 Jun 2019

Project No.

2019-062

Analytical Request: Fish Ovary Tissue Microchemistry (total metals and moisture) – 3 fish ovary tissue samples

Sample IDs: RG_STPD-RSC-14-R-O_20190604, RG_STPD-RSC-15-R-O_20190604, RG_STPD-RSC-16-R-O_20190604

Includes: LA-ICP-MS (line scans), data integration and calculations, Excel data, QA-QC results, chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalytics Inc. method MET-002.01.
Analytical results are expressed in part per million (ppm) dry weight.
Samples quantified using DORM-4 certified reference standard.

This report provides the analytical results only for fish ovary tissue samples noted above as received from the Client.

Reviewed and Approved by Jennie Christensen, PhD, RPBio

17 Jun 2019

Date

[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalytics Inc.]



TrichAnalytics Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytics.com

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_STPD-RSC-14-R-O_20190604 | RG_STPD-RSC-15-R-O_20190604 | RG_STPD-RSC-16-R-O_20190604 |
|----------------|----------|-----------------------------|-----------------------------|-----------------------------|
| Wet Weight (g) | | 0.0410 | 0.0168 | 0.0529 |
| Moisture (%) | | 37.3 | 33.3 | 61.4 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.004 | 0.152 | 0.121 | 0.080 |
| 23Na | 2 | 3,126 | 3,252 | 4,154 |
| 24Mg | 0.03 | 2,027 | 2,034 | 2,129 |
| 27Al | 0.02 | 6.48 | 8.87 | 6.38 |
| 31P | 81 | 16,462 | 16,393 | 16,753 |
| 39K | 3 | 17,189 | 18,763 | 20,350 |
| 44Ca | 12 | 1,545 | 1,763 | 1,549 |
| 51V | 0.011 | 0.175 | 0.110 | 0.097 |
| 52Cr | 0.22 | 2.11 | 2.29 | 2.03 |
| 55Mn | 0.04 | 21.8 | 19.3 | 21.6 |
| 57Fe | 0.90 | 115 | 120 | 158 |
| 59Co | 0.013 | 0.262 | 0.225 | 0.192 |
| 60Ni | 0.01 | 1.22 | 1.56 | 1.22 |
| 63Cu | 0.01 | 6.97 | 5.81 | 6.25 |
| 66Zn | 0.04 | 210 | 196 | 194 |
| 75As | 0.111 | 0.207 | 0.169 | <0.111 |
| 77Se | 0.80 | 29.6 | 36.8 | 47.1 |
| 88Sr | 0.0002 | 0.951 | 1.12 | 1.03 |
| 95Mo | 0.002 | 0.294 | 0.264 | 0.262 |
| 111Cd | 0.02 | 2.09 | 2.14 | 1.75 |
| 118Sn | 0.004 | 0.222 | 0.053 | 0.097 |
| 202Hg | 0.013 | 0.212 | 0.187 | 0.176 |
| 208Pb | 0.0003 | 0.193 | 0.119 | 0.082 |
| 238U | 0.00002 | 0.068 | 0.019 | 0.009 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_STPD-RSC-14-R-O_20190604 | RG_STPD-RSC-14-R-O_20190604 (Duplicate) | RPD | RG_STPD-RSC-15-R-O_20190604 | RG_STPD-RSC-15-R-O_20190604 (Duplicate) | RPD |
|-----------|----------|-----------------------------|---|-------|-----------------------------|---|-------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.004 | 0.152 | 0.074 | 68.4 | 0.121 | 0.079 | 42.9 |
| 23Na | 2 | 3,126 | 2,565 | 19.7 | 3,252 | 2,902 | 11.4 |
| 24Mg | 0.03 | 2,027 | 1,779 | 13.0 | 2,034 | 1,808 | 11.7 |
| 27Al | 0.02 | 6.48 | 3.66 | 55.6 | 8.87 | 4.93 | 57.2 |
| 31P | 81 | 16,462 | 15,839 | 3.9 | 16,393 | 15,145 | 7.9 |
| 39K | 3 | 17,189 | 15,083 | 13.1 | 18,763 | 17,302 | 8.1 |
| 44Ca | 12 | 1,545 | 1,227 | 22.9 | 1,763 | 1,501 | 16.0 |
| 51V | 0.011 | 0.175 | 0.092 | 61.6 | 0.110 | 0.065 | 51.5 |
| 52Cr | 0.22 | 2.11 | 1.94 | 8.3 | 2.29 | 1.90 | 18.6 |
| 55Mn | 0.04 | 21.8 | 18.1 | 19.0 | 19.3 | 17.6 | 9.5 |
| 57Fe | 0.9 | 115 | 89.2 | 24.9 | 120 | 104 | 15.0 |
| 59Co | 0.013 | 0.262 | 0.169 | 43.0 | 0.225 | 0.159 | 34.0 |
| 60Ni | 0.010 | 1.22 | 1.19 | 2.1 | 1.56 | 0.961 | 47.4 |
| 63Cu | 0.010 | 6.97 | 5.85 | 17.6 | 5.81 | 5.05 | 14.1 |
| 66Zn | 0.04 | 210 | 196 | 7.0 | 196 | 174 | 11.9 |
| 75As | 0.111 | 0.207 | 0.162 | 24.1 | 0.169 | 0.132 | 24.1 |
| 77Se | 0.8 | 29.6 | 29.2 | 1.3 | 36.8 | 37.2 | 1.3 |
| 88Sr | 0.0002 | 0.951 | 0.758 | 22.5 | 1.12 | 0.851 | 27.7 |
| 95Mo | 0.002 | 0.294 | 0.201 | 37.2 | 0.264 | 0.216 | 20.2 |
| 111Cd | 0.02 | 2.09 | 1.98 | 5.2 | 2.14 | 1.63 | 27.0 |
| 118Sn | 0.004 | 0.222 | 0.128 | 53.4 | 0.053 | 0.032 | 50.4 |
| 202Hg | 0.013 | 0.212 | 0.176 | 18.6 | 0.187 | 0.151 | 21.7 |
| 208Pb | 0.0003 | 0.193 | 0.076 | 87.5 | 0.119 | 0.045 | 90.6 |
| 238U | 0.00002 | 0.068 | 0.016 | 122.9 | 0.019 | 0.006 | 110.2 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_STPD-RSC-16-R-O_20190604 | RG_STPD-RSC-16-R-O_20190604 (Duplicate) | RPD |
|-----------|----------|-----------------------------|--|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) |
| 7Li | 0.004 | 0.080 | 0.080 | 0.5 |
| 23Na | 2 | 4,154 | 3,726 | 10.9 |
| 24Mg | 0.03 | 2,129 | 2,056 | 3.5 |
| 27Al | 0.02 | 6.38 | 9.80 | 42.3 |
| 31P | 81 | 16,753 | 15,465 | 8.0 |
| 39K | 3 | 20,350 | 17,686 | 14.0 |
| 44Ca | 12 | 1,549 | 1,496 | 3.5 |
| 51V | 0.011 | 0.097 | 0.092 | 5.5 |
| 52Cr | 0.22 | 2.03 | 2.00 | 1.6 |
| 55Mn | 0.04 | 21.6 | 19.9 | 8.2 |
| 57Fe | 0.9 | 158 | 155 | 2.0 |
| 59Co | 0.013 | 0.192 | 0.166 | 14.5 |
| 60Ni | 0.010 | 1.22 | 1.27 | 4.1 |
| 63Cu | 0.010 | 6.25 | 6.05 | 3.2 |
| 66Zn | 0.04 | 194 | 193 | 0.5 |
| 75As | 0.111 | <0.111 | <0.111 | - |
| 77Se | 0.8 | 47.1 | 45.2 | 4.1 |
| 88Sr | 0.0002 | 1.03 | 0.984 | 4.3 |
| 95Mo | 0.002 | 0.262 | 0.224 | 15.4 |
| 111Cd | 0.02 | 1.75 | 1.72 | 1.7 |
| 118Sn | 0.004 | 0.097 | 0.109 | 11.2 |
| 202Hg | 0.013 | 0.176 | 0.156 | 11.7 |
| 208Pb | 0.0003 | 0.082 | 0.095 | 14.8 |
| 238U | 0.00002 | 0.009 | 0.006 | 40.0 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Accuracy and Precision Results

| Parameter | DORM-4 Conc. (ppm) | Actual Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
|-----------|-----------------------|-----------------------|--------------|----------------------|
| 7Li | 1.21 | 1.37 | 113 | 2.1 |
| 23Na | 14,000 | 16,011 | 114 | 4.3 |
| 24Mg | 910 | 984 | 108 | 5.0 |
| 27Al | 1,280 | 1,287 | 101 | 12.5 |
| 31P | 8,000 | 7,996 | 100 | 3.5 |
| 39K | 15,500 | 17,454 | 113 | 5.0 |
| 44Ca | 2,360 | 2,940 | 125 | 3.4 |
| 51V | 1.57 | 1.58 | 101 | 13.3 |
| 52Cr | 1.87 | 2.02 | 108 | 4.8 |
| 55Mn | 3.17 | 3.43 | 108 | 8.6 |
| 57Fe | 343 | 385 | 112 | 5.6 |
| 59Co | 0.250 | 0.257 | 103 | 12.0 |
| 60Ni | 1.34 | 1.37 | 102 | 12.7 |
| 63Cu | 15.7 | 19.1 | 122 | 3.1 |
| 66Zn | 51.6 | 54.5 | 106 | 5.3 |
| 75As | 6.87 | 6.60 | 96 | 4.0 |
| 77Se | 3.45 | 2.60 | 75 | 9.6 |
| 88Sr | 10.1 | 11.36 | 112 | 2.3 |
| 95Mo | 0.290 | 0.297 | 102 | 9.0 |
| 111Cd | 0.299 | 0.307 | 103 | 4.2 |
| 118Sn | 0.061 | 0.054 | 89 | 19.9 |
| 202Hg | 0.412 | 0.392 | 95 | 5.9 |
| 208Pb | 0.404 | 0.435 | 108 | 14.5 |
| 238U | 0.050 | 0.059 | 118 | 7.9 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

| | |
|-----------|---|
| Invoicing | Reporting (if different from Invoicing) |
|-----------|---|

Project Number: RSC Toxicity Supporting Study

| | | | |
|-----------------|--|-----------------|---|
| Company Name: | Nautilus Environmental | Company Name: | |
| Contact Name: | James Elphick | Contact Name: | |
| Address: | 8664 Commerce Court | Address: | |
| City, Province: | Burnaby, BC | City, Province: | |
| Postal Code: | V5A 4N7 | Postal Code: | |
| Phone: | 1-250-216-8420 | Phone: | |
| Email: | james@nautilusenvironmental.com | Email: | james@nautilusenvironmental.com ; dsemeniuk@minnow.ca ; sweech@minnow.ca ; nigel.fisher@teck.com |

Sample Analysis Requested

| Sample Identification: | | Sample Type: | |
|------------------------|-----------------------------|--------------|--------------|
| # | ID | Species | Sample type |
| 1 | RG_STPD-RSC-14-R-O_20190604 | RSC | Unripe ovary |
| 2 | RG_STPD-RSC-15-R-O_20190604 | RSC | Unripe ovary |
| 3 | RG_STPD-RSC-16-R-O_20190604 | RSC | Unripe ovary |
| 4 | | | |
| 5 | | | |
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| | |
|---|--|
| Sample(s) Released By: David Semeniuk | Sample(s) Received By: <i>Genevieve LaBine</i> |
| Signature: <i>David Semeniuk</i> | Signature: <i>Genevieve LaBine</i> |
| Date Sent: 5-Jun-19 | Date Received: <i>14 Jun 2019 (Project#: 2019-062)</i> |
| Sample(s) Returned to Client By: NOTE: page 1 of 2 | Shipping Conditions: |
| | Shipping Container: |
| Signature: | Date Sent: |



TrichAnalytics Inc.

Fish Ovary Tissue Microchemistry Analysis Report

Client:

James Elphick
Nautilus Environmental Inc.
8664 Commerce Court, Burnaby, BC
V8A 4N7
Ph: 250-216-8420
[Email: james@nautilusenvironmental.com](mailto:james@nautilusenvironmental.com)

Date Received:

04 Jul 2019

Report Date:

26 Jul 2019

Project No.

2019-066

Analytical Request: Fish Ovary Tissue Microchemistry (total metals and moisture) – 12 fish ovary tissue samples

See chain of custody form provided for sample identification numbers.

Includes: LA-ICP-MS (line scans), data integration and calculations, Excel data, QA-QC results, chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalytics Inc. method MET-002.02.

Analytical results are expressed in part per million (ppm) dry weight.

Samples quantified using DORM-4 certified reference standard.

This report provides the analytical results only for fish ovary tissue samples noted above as received from the Client.

Reviewed and Approved by Jennie Christensen, PhD, RPBio

26 Jul 2019

Date

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TrichAnalytics Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytics.com

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ER_RSC-03-R-O_20190621 | RG_ER_RSC-04-R-O_20190622 | RG_ER_RSC-05-R-O_20190622 | RG_ER_RSC-06-R-O_20190624 |
|----------------|----------|---------------------------|---------------------------|---------------------------|---------------------------|
| Wet Weight (g) | | 0.0527 | 0.0447 | 0.1024 | 0.1014 |
| Moisture (%) | | 63.0 | 66.4 | 70.2 | 65.4 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.006 | 0.043 | 0.048 | 0.315 | 0.073 |
| 23Na | 0.312 | 2,800 | 3,312 | 6,096 | 4,309 |
| 24Mg | 0.020 | 1,868 | 1,830 | 2,400 | 1,693 |
| 27Al | 0.019 | 3.44 | 4.90 | 16.2 | 3.84 |
| 31P | 63.5 | 17,299 | 15,225 | 19,596 | 16,767 |
| 39K | 3.35 | 15,354 | 16,879 | 22,131 | 13,052 |
| 44Ca | 6.79 | 1,001 | 1,327 | 2,555 | 1,252 |
| 51V | 0.011 | 0.083 | 0.146 | 0.466 | 0.132 |
| 52Cr | 0.020 | 2.05 | 2.16 | 3.40 | 2.41 |
| 55Mn | 0.002 | 22.6 | 23.2 | 39.3 | 16.8 |
| 57Fe | 0.272 | 155 | 142 | 372 | 155 |
| 59Co | 0.005 | 0.145 | 0.180 | 0.518 | 0.153 |
| 60Ni | 0.010 | 1.16 | 1.29 | 2.74 | 1.15 |
| 63Cu | 0.005 | 5.99 | 6.02 | 8.25 | 6.04 |
| 66Zn | 0.048 | 293 | 231 | 321 | 197 |
| 75As | 0.130 | 0.162 | 0.205 | 0.557 | 0.329 |
| 77Se | 1.53 | 30.3 | 27.8 | 38.9 | 18.7 |
| 88Sr | 0.0002 | 0.841 | 0.785 | 2.46 | 1.04 |
| 95Mo | 0.002 | 0.129 | 0.120 | 0.407 | 0.123 |
| 111Cd | 0.057 | 1.78 | 1.54 | 7.87 | 1.25 |
| 118Sn | 0.003 | 0.055 | 0.129 | 0.348 | 0.213 |
| 202Hg | 0.008 | 0.211 | 0.176 | 0.280 | 0.129 |
| 208Pb | 0.0004 | 0.057 | 0.090 | 0.425 | 0.107 |
| 238U | 0.0001 | 0.005 | 0.013 | 0.154 | 0.015 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ER_RSC-07-R-O_20190624 | RG_ER_RSC-08-R-O_20190624 | RG_ER_RSC-09-R-O_20190624 | RG_ER_RSC-10-R-O_20190624 |
|----------------|----------|---------------------------|---------------------------|---------------------------|---------------------------|
| Wet Weight (g) | | 0.0116 | 0.0804 | 0.0588 | 0.0671 |
| Moisture (%) | | 35.3 | 72.1 | 67.3 | 70.0 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.006 | 0.043 | 0.023 | 0.081 | 0.304 |
| 23Na | 0.312 | 2,598 | 2,998 | 5,537 | 5,407 |
| 24Mg | 0.020 | 1,078 | 1,612 | 2,254 | 2,339 |
| 27Al | 0.019 | 5.06 | 0.955 | 4.27 | 14.8 |
| 31P | 63.5 | 12,814 | 16,664 | 20,489 | 22,019 |
| 39K | 3.35 | 7,661 | 19,073 | 21,450 | 21,140 |
| 44Ca | 6.79 | 606 | 910 | 2,125 | 2,052 |
| 51V | 0.011 | 0.135 | 0.053 | 0.111 | 0.375 |
| 52Cr | 0.020 | 1.48 | 1.74 | 1.89 | 3.16 |
| 55Mn | 0.002 | 7.61 | 11.2 | 24.7 | 34.9 |
| 57Fe | 0.272 | 60.5 | 147 | 245 | 194 |
| 59Co | 0.005 | 0.121 | 0.112 | 0.209 | 0.453 |
| 60Ni | 0.010 | 0.521 | 0.841 | 0.802 | 1.85 |
| 63Cu | 0.005 | 3.74 | 4.95 | 8.16 | 8.65 |
| 66Zn | 0.048 | 85.4 | 239 | 426 | 332 |
| 75As | 0.130 | 0.525 | <0.130 | 0.748 | 0.714 |
| 77Se | 1.53 | 5.92 | 40.4 | 35.2 | 27.3 |
| 88Sr | 0.0002 | 0.685 | 0.679 | 2.10 | 2.08 |
| 95Mo | 0.002 | 0.091 | 0.139 | 0.213 | 0.379 |
| 111Cd | 0.057 | 0.640 | 1.25 | 2.57 | 7.85 |
| 118Sn | 0.003 | 0.104 | 0.054 | 0.484 | 0.412 |
| 202Hg | 0.008 | 0.072 | 0.143 | 0.279 | 0.264 |
| 208Pb | 0.0004 | 0.071 | 0.014 | 0.105 | 0.376 |
| 238U | 0.0001 | 0.005 | 0.001 | 0.014 | 0.130 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue Analysis

| Sample ID | | RG_ER_RSC-11-R-O_20190624 | RG_ER_RSC-12-R-O_20190624 | RG_ER_RSC-13-R-O_20190624 | RG_ER_RSC-14-R-O_20190624 |
|----------------|----------|---------------------------|---------------------------|---------------------------|---------------------------|
| Wet Weight (g) | | 0.1098 | 0.1178 | 0.0690 | 0.2637 |
| Moisture (%) | | 68.8 | 72.9 | 68.6 | 74.0 |
| Parameter | DL (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.006 | 0.038 | 0.029 | 0.020 | 0.155 |
| 23Na | 0.312 | 3,228 | 2,402 | 3,444 | 4,318 |
| 24Mg | 0.020 | 1,829 | 1,979 | 1,573 | 2,040 |
| 27Al | 0.019 | 1.76 | 1.69 | 0.982 | 7.83 |
| 31P | 63.5 | 15,762 | 14,519 | 15,706 | 18,196 |
| 39K | 3.35 | 14,520 | 13,980 | 15,852 | 17,549 |
| 44Ca | 6.79 | 1,051 | 1,465 | 963 | 1,846 |
| 51V | 0.011 | 0.058 | 0.064 | 0.024 | 0.227 |
| 52Cr | 0.020 | 1.48 | 1.46 | 1.28 | 2.13 |
| 55Mn | 0.002 | 25.6 | 25.2 | 16.7 | 19.5 |
| 57Fe | 0.272 | 118 | 149 | 154 | 205 |
| 59Co | 0.005 | 0.136 | 0.102 | 0.095 | 0.241 |
| 60Ni | 0.010 | 0.390 | 0.438 | 0.267 | 1.08 |
| 63Cu | 0.005 | 5.87 | 5.44 | 4.04 | 6.45 |
| 66Zn | 0.048 | 189 | 253 | 259 | 316 |
| 75As | 0.130 | 0.286 | 0.133 | 0.241 | 0.722 |
| 77Se | 1.53 | 19.6 | 41.3 | 25.8 | 22.7 |
| 88Sr | 0.0002 | 0.752 | 0.793 | 0.753 | 1.28 |
| 95Mo | 0.002 | 0.139 | 0.160 | 0.116 | 0.256 |
| 111Cd | 0.057 | 1.08 | 1.50 | 1.34 | 3.52 |
| 118Sn | 0.003 | 0.206 | 0.111 | 0.099 | 0.703 |
| 202Hg | 0.008 | 0.149 | 0.164 | 0.167 | 0.234 |
| 208Pb | 0.0004 | 0.042 | 0.041 | 0.008 | 0.250 |
| 238U | 0.0001 | 0.004 | 0.007 | 0.0004 | 0.066 |

Notes:

ppm = parts per million

DL = detection limit

g = grams

% = percent

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_ER_RSC-03-R-O_20190621 | RG_ER_RSC-03-R-O_20190621 (Duplicate) | RPD | RG_ER_RSC-07-R-O_20190624 | RG_ER_RSC-07-R-O_20190624 (Duplicate) | RPD |
|-----------|----------|---------------------------|---------------------------------------|------|---------------------------|---------------------------------------|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.006 | 0.043 | 0.090 | - | 0.043 | 0.037 | - |
| 23Na | 0.312 | 2,800 | 2,932 | 4.6 | 2,598 | 2,682 | 3.2 |
| 24Mg | 0.020 | 1,868 | 1,852 | 0.9 | 1,078 | 1,192 | 10.0 |
| 27Al | 0.019 | 3.44 | 3.82 | 10.5 | 5.06 | 4.91 | 2.9 |
| 31P | 63.5 | 17,299 | 17,112 | 1.1 | 12,814 | 13,537 | 5.5 |
| 39K | 3.35 | 15,354 | 15,165 | 1.2 | 7,661 | 8,556 | 11.0 |
| 44Ca | 6.79 | 1,001 | 1,160 | 14.7 | 606 | 525 | 14.4 |
| 51V | 0.011 | 0.083 | 0.150 | - | 0.135 | 0.062 | - |
| 52Cr | 0.020 | 2.05 | 2.67 | 26.2 | 1.48 | 1.44 | 2.8 |
| 55Mn | 0.002 | 22.6 | 23.8 | 5.3 | 7.6 | 8.1 | 6.0 |
| 57Fe | 0.272 | 155 | 164 | 5.4 | 60.5 | 68.5 | 12.4 |
| 59Co | 0.005 | 0.145 | 0.207 | 35.0 | 0.121 | 0.104 | 15.5 |
| 60Ni | 0.010 | 1.16 | 1.78 | 42.0 | 0.521 | 0.500 | 4.2 |
| 63Cu | 0.005 | 5.99 | 6.20 | 3.4 | 3.74 | 4.09 | 9.1 |
| 66Zn | 0.048 | 293 | 303 | 3.5 | 85.4 | 92.6 | 8.0 |
| 75As | 0.130 | 0.162 | 0.325 | - | 0.525 | 0.477 | - |
| 77Se | 1.53 | 30.3 | 29.3 | - | 5.92 | 6.48 | - |
| 88Sr | 0.0002 | 0.841 | 1.01 | 18.1 | 0.685 | 0.574 | 17.7 |
| 95Mo | 0.002 | 0.129 | 0.181 | 33.3 | 0.091 | 0.076 | 18.1 |
| 111Cd | 0.057 | 1.78 | 1.59 | 11.2 | 0.640 | 0.464 | - |
| 118Sn | 0.003 | 0.055 | 0.104 | - | 0.104 | 0.096 | 7.5 |
| 202Hg | 0.008 | 0.211 | 0.219 | 3.7 | 0.072 | 0.064 | - |
| 208Pb | 0.0004 | 0.057 | 0.062 | 7.8 | 0.071 | 0.063 | 11.5 |
| 238U | 0.0001 | 0.005 | 0.007 | 38.3 | 0.005 | 0.004 | 22 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Data Quality Objectives:

Laboratory Duplicates - RPD \leq 40% for all elements (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016)
 Only applies to QC samples at concentrations above 20X Detection Limit

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Relative Percent Difference Results

| Sample ID | | RG_ER_RSC-14-R-O_20190624 | RG_ER_RSC-14-R-O_20190624 (Duplicate) | RPD |
|-----------|----------|---------------------------|---------------------------------------|------|
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) |
| 7Li | 0.006 | 0.155 | 0.181 | 15.3 |
| 23Na | 0.312 | 4,318 | 4,532 | 4.8 |
| 24Mg | 0.020 | 2,040 | 2,095 | 2.7 |
| 27Al | 0.019 | 7.83 | 8.13 | 3.8 |
| 31P | 63.5 | 18,196 | 18,630 | 2.4 |
| 39K | 3.35 | 17,549 | 17,882 | 1.9 |
| 44Ca | 6.79 | 1,846 | 2,273 | 20.7 |
| 51V | 0.011 | 0.227 | 0.284 | 22.4 |
| 52Cr | 0.020 | 2.13 | 2.81 | 27.7 |
| 55Mn | 0.002 | 19.5 | 21.6 | 10.4 |
| 57Fe | 0.272 | 205 | 216 | 5.4 |
| 59Co | 0.005 | 0.241 | 0.350 | 36.8 |
| 60Ni | 0.010 | 1.08 | 1.45 | 29.4 |
| 63Cu | 0.005 | 6.45 | 7.20 | 11.1 |
| 66Zn | 0.048 | 316 | 345 | 8.8 |
| 75As | 0.130 | 0.722 | 0.834 | - |
| 77Se | 1.53 | 22.7 | 23.1 | - |
| 88Sr | 0.0002 | 1.28 | 1.70 | 28.1 |
| 95Mo | 0.002 | 0.256 | 0.341 | 28.6 |
| 111Cd | 0.057 | 3.52 | 3.81 | 8.0 |
| 118Sn | 0.003 | 0.703 | 0.855 | 19.5 |
| 202Hg | 0.008 | 0.234 | 0.240 | 2.4 |
| 208Pb | 0.0004 | 0.250 | 0.361 | 36.3 |
| 238U | 0.0001 | 0.066 | 0.052 | 23.0 |

Notes:

ppm = parts per million
 RPD = Relative Percent Difference
 % = percent

Data Quality Objectives:

Laboratory Duplicates - RPD \leq 40% for all elements (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016)
 Only applies to QC samples at concentrations above 20X Detection Limit

Nautilus Environmental Inc. - Fish Ovary Tissue QA/QC Accuracy and Precision Results

| Parameter | Detection Limit (ppm) | Certified Value DORM-4 Conc. (ppm) | Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
|-----------|-----------------------|------------------------------------|----------------------|--------------|-------------------|
| 7Li | 0.006 | 1.21 | 1.30 | 108 | 2.2 |
| 23Na | 0.312 | 14,000 | 15,639 | 112 | 4.2 |
| 24Mg | 0.020 | 910 | 1,004 | 110 | 12.0 |
| 27Al | 0.019 | 1,280 | 1,534 | 120 | 0.8 |
| 31P | 63.5 | 8,000 | 9,302 | 116 | 3.5 |
| 39K | 3.35 | 15,500 | 17,108 | 110 | 1.3 |
| 44Ca | 6.79 | 2,360 | 2,718 | 115 | 4.8 |
| 51V | 0.011 | 1.57 | 1.83 | 116 | 3.1 |
| 52Cr | 0.020 | 1.87 | 2.11 | 113 | 7.9 |
| 55Mn | 0.002 | 3.17 | 3.57 | 113 | 8.1 |
| 57Fe | 0.272 | 343 | 386 | 112 | 4.9 |
| 59Co | 0.005 | 0.25 | 0.275 | 110 | 5.4 |
| 60Ni | 0.010 | 1.34 | 1.50 | 112 | 10.2 |
| 63Cu | 0.005 | 15.7 | 18.5 | 118 | 0.6 |
| 66Zn | 0.048 | 51.6 | 58.2 | 113 | 1.0 |
| 75As | 0.130 | 6.87 | 7.81 | 114 | 2.9 |
| 77Se | 1.53 | 3.45 | 3.85 | 112 | 1.5 |
| 88Sr | 0.0002 | 10.1 | 11.7 | 116 | 3.5 |
| 95Mo | 0.002 | 0.29 | 0.328 | 113 | 3.0 |
| 111Cd | 0.057 | 0.299 | 0.374 | 125 | 2.1 |
| 118Sn | 0.003 | 0.061 | 0.057 | 93 | 23.8 |
| 202Hg | 0.008 | 0.412 | 0.488 | 118 | 2.8 |
| 208Pb | 0.0004 | 0.404 | 0.365 | 90 | 1.5 |
| 238U | 0.0001 | 0.050 | 0.058 | 116 | 0.0 |

Notes:

ppm = parts per million
 % = percent
 RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: 70 - 130% of the certified values for the method (as per BC MOE, *British Columbia Environmental Laboratory Manual*, 2015 Edition, February 2016)

BC laboratory standards for RSD (precision) of reference material are not available; therefore a DQO $\leq 20\%$ was established for all elements

| | | | |
|--|---------------------------------|--|--|
| TrichAnalytics Inc. 207-1753 Sean Heights, Saanichton, BC, V8M 0B3 Ph: (250) 532-1084 | | Chain of Custody (COC) for LA-ICP-MS Analysis | |
| Invoicing | | Repo } (if different from Invoicing) | |
| Project Number: RSC Toxicity Supporting Study | | | |
| Company Name: | Nautilus Environmental | Company Name: | |
| Contact Name: | James Elphick | Contact Name: | |
| Address: | 8664 Commerce Court | Address: | |
| City, Province: | Burnaby, BC | City, Province: | |
| Postal Code: | V5A 4N7 | Postal Code: | |
| Phone: | 1-250-216-8420 | Phone: | |
| Email: | james@nautilusenvironmental.com | Email: | @nautilusenvironmental.com, dsemeniuk@minnow.ca, sweech@minnow.ca, j.fisher@teck.com |
| Sample Identification: | | Sample Type: | |
| | | Sr | Sample type |
| 1 | RG_ER-RSC-03-R-O_20190621 | RSC | Unripe ovary |
| 2 | RG_ER-RSC-04-R-O_20190622 | RSC | Unripe ovary |
| 3 | RG_ER-RSC-05-R-O_20190622 | RSC | Unripe ovary |
| 4 | RG_ER-RSC-06-R-O_20190624 | RSC | Unripe ovary |
| 5 | RG_ER-RSC-07-R-O_20190624 | RSC | Unripe ovary |
| 6 | RG_ER-RSC-08-R-O_20190624 | RSC | Unripe ovary |
| 7 | RG_ER-RSC-09-R-O_20190624 | RSC | Unripe ovary |
| 8 | RG_ER-RSC-10-R-O_20190624 | RSC | Unripe ovary |
| 9 | RG_ER-RSC-11-R-O_20190624 | RSC | Unripe ovary |
| 10 | RG_ER-RSC-12-R-O_20190624 | RSC | Unripe ovary |
| 11 | RG_ER-RSC-13-R-O_20190624 | RSC | Unripe ovary |
| 12 | RG_ER-RSC-14-R-O_20190624 | RSC | Unripe ovary |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| Sample(s) Released By: David Semeniuk | | Sample(s) Received By: <i>GERRIENE LABINE</i> | |
| Signature: <i>David Semeniuk</i> | | Signature: <i>Gerriene Labine</i> | |
| Date Sent: 2-Jul-19 | | Date Received: 04 Jul 2019. (Project #: 2019-066) | |
| Sample(s) Returned to Client By: NOTE: page 1 of 2 | | Shipping Conditions: | |
| | | Shipping Container: | |
| Signature: | | Date Sent: | |

TrichAnalytics
Ripe Egg Analysis



TrichAnalytics Inc.

Fish Tissue Microchemistry Analysis Report

Client:
Cait Good
Lead, Regional Water Monitoring
Teck Coal Limited
Phone: 250.425.8202
Email: Cait.Good@teck.com

Date Received: 21 May 2020
Final Report Date: 27 May 2020
Report Revision Date: 06 Jul 2020
Project No. 2020-113
Revision No. Rev. 1

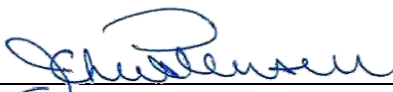
Analytical Request: Fish Egg Tissue Microchemistry (total metals and moisture) – 60 samples.
See chain of custody form provided for sample identification numbers.

Includes: LA-ICP-MS (line scans), data integration and calculations, QA/QC results, Excel data, and chain of custody form.

Notes:

Samples prepared and analyzed using TrichAnalytics Inc. CALA accredited analytical method MET-002.04.
Four point analytical balance used to measure sample weights. Accuracy +/- 0.1 mg.
Analytical results are expressed in part per million (ppm) dry weight.
Samples quantified using DORM-4, NIST-1566b, and NIST-2976 certified reference standards.
Client specific DQO for Selenium accuracy is 90 - 110% of the certified values; (average achieved 105%; range 93 - 110%).
Individual standard concentrations provided to determine accuracy, as requested.
Client requested on 06 Jul 2020 that RPD values be compared with British Columbia Environmental Laboratory Manual (2020) criteria.

This report provides the analytical results only for tissue samples noted above as received from the Client.


Reviewed and Approved by Jennie Christensen, PhD, RPBio
[The analytical report shall not be reproduced except in full under the expressed written consent of TrichAnalytics Inc.]

06 Jul 2020
Date



TrichAnalytics Inc.

207-1753 Sean Heights
Saanichton, BC V8M 0B3
www.trichanalytics.com

Fish Tissue Analysis
COM-013.02

TrichAnalytics Inc.



Project No. 2020-113

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | STPD-01 | STPD-02 | STPD-03 | STPD-04 | STPD-05 | STPD-06 | STPD-07 | STPD-08 | STPD-09 | STPD-10 |
|----------------------|----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Laboratory Sample ID | | | 001 | 002 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 |
| Wet Weight (mg) | | | 57.3 | 207.3 | 110.3 | 82.7 | 92.6 | 126.1 | 2.6 | 49.6 | 89.4 | 38.0 |
| Dry Weight (mg) | | | 36.2 | 89.8 | 55.3 | 33.8 | 42.4 | 53.3 | 1.7 | 30.6 | 40.5 | 21.0 |
| Moisture (%) | | | 36.8 | 56.7 | 49.9 | 59.1 | 54.2 | 57.7 | 34.6 | 38.3 | 54.7 | 44.7 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.027 | 0.023 | 0.032 | 0.041 | 0.041 | 0.032 | 0.035 | 0.023 | 0.023 | 0.025 |
| 11B | 0.096 | 0.320 | 0.106 | 0.112 | <0.096 | 0.129 | 0.100 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 |
| 23Na | 3.1 | 10 | 2,983 | 2,845 | 2,420 | 2,830 | 3,151 | 2,852 | 1,776 | 2,071 | 2,089 | 1,820 |
| 24Mg | 0.069 | 0.230 | 840 | 779 | 791 | 905 | 981 | 780 | 737 | 774 | 708 | 602 |
| 27Al | 0.060 | 0.200 | 4.2 | 2.4 | 2.4 | 5.8 | 2.7 | 1.3 | 0.194 | 0.507 | 1.6 | 1.4 |
| 31P | 52 | 173 | 12,696 | 12,864 | 12,763 | 13,926 | 13,675 | 12,493 | 10,552 | 12,048 | 11,309 | 11,241 |
| 39K | 0.992 | 3.3 | 8,505 | 9,399 | 9,667 | 10,339 | 10,922 | 9,514 | 7,694 | 8,068 | 6,849 | 7,571 |
| 44Ca | 10 | 33 | 440 | 385 | 333 | 387 | 451 | 347 | 245 | 241 | 226 | 248 |
| 49Ti | 0.158 | 0.527 | 1.1 | 0.738 | 0.922 | 1.4 | 0.968 | 0.738 | 0.553 | 0.692 | 0.553 | 0.830 |
| 51V | 0.030 | 0.100 | 0.064 | 0.035 | <0.030 | 0.056 | 0.046 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 |
| 52Cr | 0.099 | 0.330 | 3.2 | 1.9 | 1.9 | 2.9 | 2.2 | 1.5 | 1.1 | 1.3 | 1.4 | 1.4 |
| 55Mn | 0.013 | 0.043 | 4.4 | 5.5 | 3.2 | 4.1 | 7.9 | 4.1 | 4.4 | 3.4 | 3.5 | 3.4 |
| 57Fe | 0.793 | 2.6 | 59 | 58 | 41 | 67 | 51 | 34 | 37 | 34 | 36 | 34 |
| 59Co | 0.003 | 0.010 | 0.146 | 0.080 | 0.081 | 0.121 | 0.077 | 0.080 | 0.036 | 0.044 | 0.055 | 0.032 |
| 60Ni | 0.013 | 0.043 | 1.9 | 1.2 | 0.917 | 3.1 | 1.2 | 0.401 | <0.013 | 0.106 | 0.229 | 0.368 |
| 63Cu | 0.005 | 0.017 | 5.7 | 4.9 | 5.2 | 4.9 | 4.5 | 4.8 | 2.5 | 4.2 | 3.9 | 4.4 |
| 66Zn | 0.232 | 0.773 | 78 | 72 | 67 | 90 | 90 | 74 | 60 | 66 | 67 | 67 |
| 75As | 0.420 | 1.4 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 |
| 77Se | 0.320 | 1.1 | 22 | 22 | 21 | 26 | 24 | 19 | 19 | 22 | 21 | 20 |
| 88Sr | 0.001 | 0.003 | 0.410 | 0.319 | 0.315 | 0.329 | 0.348 | 0.294 | 0.240 | 0.271 | 0.244 | 0.204 |
| 95Mo | 0.001 | 0.003 | 0.062 | 0.055 | 0.048 | 0.062 | 0.066 | 0.041 | 0.048 | 0.035 | 0.041 | 0.041 |
| 107Ag | 0.001 | 0.003 | 0.052 | 0.039 | 0.041 | 0.069 | 0.057 | 0.038 | 0.028 | 0.057 | 0.031 | 0.044 |
| 111Cd | 0.043 | 0.143 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.223 | 0.198 | 0.091 | 0.270 | 0.330 | 0.198 | 0.035 | 0.177 | 0.163 | 0.176 |
| 121Sb | 0.001 | 0.003 | 0.005 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | <0.001 | 0.001 | 0.003 | 0.003 |
| 137Ba | 0.001 | 0.003 | 0.727 | 0.799 | 1.0 | 0.981 | 0.872 | 0.927 | 0.709 | 0.745 | 0.727 | 0.345 |
| 202Hg | 0.033 | 0.110 | <0.033 | <0.033 | <0.033 | <0.033 | <0.033 | <0.033 | <0.033 | 0.057 | 0.063 | <0.033 |
| 205Tl | 0.001 | 0.003 | 0.011 | 0.009 | 0.011 | 0.005 | 0.005 | 0.004 | 0.005 | 0.005 | 0.006 | 0.005 |
| 208Pb | 0.001 | 0.003 | 0.009 | 0.004 | 0.004 | 0.012 | 0.004 | 0.003 | 0.001 | 0.003 | 0.001 | 0.003 |
| 238U | 0.001 | 0.003 | 0.002 | 0.001 | <0.001 | 0.002 | 0.001 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | STPD-11 | STPD-12 | STPD-13 | STPD-14 | STPD-15 | STPD-16 | ERIMF-4 | ERIMF-5 | ERIMF-6 | ERIMF-7 |
|----------------------|----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Laboratory Sample ID | | | 011 | 012 | 013 | 014 | 015 | 016 | 017 | 018 | 019 | 020 |
| Wet Weight (mg) | | | 29.9 | 31.3 | 26.1 | 209.9 | 73.5 | 72.7 | 81.6 | 85.3 | 43.4 | 154.3 |
| Dry Weight (mg) | | | 19.1 | 18.8 | 10.5 | 89.0 | 32.5 | 25.7 | 47.8 | 41.3 | 25.1 | 66.5 |
| Moisture (%) | | | 36.1 | 39.9 | 59.8 | 57.6 | 55.8 | 64.6 | 41.4 | 51.6 | 42.2 | 56.9 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.041 | 0.039 | 0.062 | 0.044 | 0.055 | 0.039 | 0.018 | 0.025 | 0.022 | 0.016 |
| 11B | 0.096 | 0.320 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | 0.145 | <0.096 |
| 23Na | 3.1 | 10.3 | 2,892 | 2,873 | 3,165 | 2041 | 2,917 | 2,515 | 2,675 | 2,691 | 2,973 | 2,650 |
| 24Mg | 0.069 | 0.230 | 932 | 692 | 802 | 748 | 880 | 766 | 724 | 703 | 1,021 | 901 |
| 27Al | 0.060 | 0.2 | 6.6 | 2.8 | 5.4 | 1.2 | 3.1 | 1.4 | 0.989 | 1.5 | 4.1 | 1.9 |
| 31P | 52 | 173 | 13,783 | 12,611 | 13,040 | 12154 | 12,552 | 11,348 | 10,739 | 11,763 | 13,252 | 13,080 |
| 39K | 0.992 | 3.3 | 10,234 | 8,627 | 9,031 | 7635 | 8,980 | 7,562 | 9,415 | 8,932 | 9,702 | 8,823 |
| 44Ca | 10 | 33 | 423 | 398 | 411 | 285 | 397 | 274 | 484 | 357 | 455 | 447 |
| 49Ti | 0.158 | 0.5 | 1.3 | 0.922 | 1.1 | 0.738 | 0.922 | 0.738 | 0.646 | 0.922 | 1.2 | 0.952 |
| 51V | 0.030 | 0.100 | 0.061 | 0.042 | 0.071 | <0.030 | 0.042 | <0.030 | <0.030 | 0.035 | 0.053 | 0.035 |
| 52Cr | 0.099 | 0.330 | 2.7 | 2.2 | 3.4 | 1.5 | 2.0 | 1.5 | 1.4 | 1.6 | 2.2 | 1.7 |
| 55Mn | 0.013 | 0.043 | 3.8 | 4.4 | 3.8 | 3.7 | 4.8 | 4.4 | 6.3 | 4.7 | 7.5 | 6.2 |
| 57Fe | 0.793 | 2.6 | 69 | 40 | 69 | 30 | 41 | 33 | 38 | 29 | 38 | 36 |
| 59Co | 0.003 | 0.010 | 0.116 | 0.058 | 0.164 | 0.048 | 0.072 | 0.048 | 0.061 | 0.069 | 0.062 | 0.086 |
| 60Ni | 0.013 | 0.043 | 1.9 | 1.2 | 3.4 | 0.409 | 0.925 | 0.425 | 0.417 | 0.597 | 1.3 | 0.454 |
| 63Cu | 0.005 | 0.017 | 5.4 | 4.6 | 3.9 | 5.1 | 4.3 | 4.2 | 2.6 | 5.5 | 1.8 | 3.3 |
| 66Zn | 0.232 | 0.773 | 89 | 74 | 79 | 93 | 73 | 55 | 80 | 92 | 121 | 107 |
| 75As | 0.420 | 1.4 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 |
| 77Se | 0.320 | 1.1 | 28 | 23 | 23 | 19 | 19 | 22 | 3.5 | 4.1 | 2.5 | 3.4 |
| 88Sr | 0.001 | 0.003 | 0.342 | 0.423 | 0.396 | 0.258 | 0.562 | 0.374 | 0.295 | 0.264 | 0.369 | 0.328 |
| 95Mo | 0.001 | 0.003 | 0.069 | 0.062 | 0.055 | 0.048 | 0.069 | 0.048 | 0.083 | 0.062 | 0.074 | 0.052 |
| 107Ag | 0.001 | 0.003 | 0.047 | 0.044 | 0.037 | 0.031 | 0.030 | 0.031 | 0.013 | 0.037 | 0.006 | 0.018 |
| 111Cd | 0.043 | 0.143 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | 0.052 | 0.047 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.380 | 0.149 | 0.378 | 0.311 | 0.347 | 0.254 | 0.171 | 0.248 | 0.324 | 0.353 |
| 121Sb | 0.001 | 0.003 | 0.003 | 0.003 | 0.005 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| 137Ba | 0.001 | 0.003 | 1.2 | 1.0 | 0.999 | 1.1 | 1.5 | 0.909 | 1.4 | 1.5 | 3.1 | 1.9 |
| 202Hg | 0.033 | 0.110 | <0.033 | <0.033 | <0.033 | <0.033 | 0.061 | <0.033 | <0.033 | 0.146 | <0.033 | 0.041 |
| 205Tl | 0.001 | 0.003 | 0.006 | 0.005 | 0.005 | 0.008 | 0.009 | 0.005 | 0.005 | 0.004 | 0.004 | 0.004 |
| 208Pb | 0.001 | 0.003 | 0.005 | 0.004 | 0.007 | 0.005 | 0.012 | 0.004 | 0.003 | 0.005 | 0.011 | 0.005 |
| 238U | 0.001 | 0.003 | 0.002 | 0.001 | 0.001 | <0.001 | 0.001 | 0.001 | 0.003 | 0.001 | 0.003 | 0.004 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | ERIMF-8 | ERIMF-9 | ERIMF-10 | ERIMF-11 | ERIMF-12 | ERIMF-13 | ERIMF-14 | ERIMF-15 | ERIMF-16 | LNLK-11 |
|----------------------|----------|-----------|---------|---------|----------|----------|----------|----------|----------|----------|----------|---------|
| Laboratory Sample ID | | | 021 | 022 | 023 | 024 | 025 | 026 | 027 | 028 | 029 | 030 |
| Wet Weight (mg) | | | 85.5 | 75.2 | 102.5 | 79.5 | 95.2 | 42.6 | 123.4 | 153.3 | 103.4 | 71.7 |
| Dry Weight (mg) | | | 39.2 | 35.5 | 42.6 | 40.1 | 38.6 | 20.3 | 49.7 | 57.2 | 47.4 | 32.8 |
| Moisture (%) | | | 54.2 | 52.8 | 58.4 | 49.6 | 59.5 | 52.3 | 59.7 | 62.7 | 54.2 | 54.3 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.018 | 0.018 | 0.014 | 0.011 | 0.025 | 0.016 | 0.021 | 0.011 | 0.018 | 0.014 |
| 11B | 0.096 | 0.320 | 0.102 | 0.116 | <0.096 | 0.116 | <0.096 | 0.109 | <0.096 | <0.096 | 0.102 | <0.096 |
| 23Na | 3.1 | 10.3 | 2,278 | 2,590 | 2,637 | 2,432 | 2,951 | 1,918 | 2,668 | 2,789 | 3,098 | 4,504 |
| 24Mg | 0.069 | 0.230 | 946 | 1,102 | 969 | 955 | 1,091 | 1,043 | 1,101 | 928 | 1,058 | 922 |
| 27Al | 0.060 | 0.2 | 2.4 | 2.0 | 2.0 | 1.5 | 1.7 | 3.7 | 3.6 | 1.5 | 1.5 | 1.5 |
| 31P | 52 | 173 | 13,600 | 13,067 | 12,641 | 13,106 | 13,184 | 13,585 | 12,304 | 12,351 | 13,489 | 13,792 |
| 39K | 0.992 | 3.3 | 9,150 | 9,426 | 9,867 | 9,733 | 10,494 | 10,707 | 10,123 | 8,940 | 10,657 | 9,017 |
| 44Ca | 10 | 33 | 407 | 446 | 420 | 394 | 525 | 374 | 510 | 422 | 496 | 489 |
| 49Ti | 0.158 | 0.5 | 1.3 | 1.1 | 1.3 | 0.952 | 1.3 | 1.2 | 1.3 | 0.952 | 0.952 | 0.657 |
| 51V | 0.030 | 0.100 | 0.039 | 0.042 | 0.046 | 0.042 | 0.042 | 0.053 | 0.055 | 0.039 | 0.047 | 0.043 |
| 52Cr | 0.099 | 0.330 | 1.8 | 1.9 | 2.0 | 1.8 | 2.1 | 2.5 | 2.5 | 1.5 | 1.9 | 1.7 |
| 55Mn | 0.013 | 0.043 | 5.7 | 6.0 | 8.3 | 5.7 | 9.9 | 4.5 | 9.3 | 6.6 | 5.4 | 6.5 |
| 57Fe | 0.793 | 2.6 | 40 | 41 | 41 | 30 | 61 | 62 | 57 | 38 | 54 | 48 |
| 59Co | 0.003 | 0.010 | 0.103 | 0.051 | 0.064 | 0.074 | 0.065 | 0.102 | 0.168 | 0.061 | 0.062 | 0.048 |
| 60Ni | 0.013 | 0.043 | 0.737 | 1.0 | 0.890 | 0.674 | 1.3 | 1.9 | 2.0 | 0.395 | 0.863 | 0.458 |
| 63Cu | 0.005 | 0.017 | 5.1 | 2.0 | 2.5 | 1.9 | 3.8 | 5.3 | 3.8 | 6.1 | 5.5 | 4.6 |
| 66Zn | 0.232 | 0.773 | 112 | 98 | 117 | 109 | 125 | 120 | 135 | 130 | 123 | 98 |
| 75As | 0.420 | 1.4 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 |
| 77Se | 0.320 | 1.1 | 5.8 | 5.0 | 5.0 | 5.9 | 3.6 | 4.5 | 11 | 3.2 | 4.2 | 0.711 |
| 88Sr | 0.001 | 0.003 | 0.290 | 0.260 | 0.273 | 0.229 | 0.433 | 0.325 | 0.362 | 0.274 | 0.395 | 0.353 |
| 95Mo | 0.001 | 0.003 | 0.067 | 0.082 | 0.082 | 0.067 | 0.097 | 0.074 | 0.097 | 0.082 | 0.082 | 0.078 |
| 107Ag | 0.001 | 0.003 | 0.033 | 0.013 | 0.015 | 0.013 | 0.011 | 0.041 | 0.053 | 0.034 | 0.037 | 0.032 |
| 111Cd | 0.043 | 0.143 | <0.043 | 0.047 | <0.043 | <0.043 | 0.058 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.409 | 0.512 | 0.239 | 0.258 | 0.268 | 0.405 | 0.330 | 0.356 | 0.324 | 0.227 |
| 121Sb | 0.001 | 0.003 | 0.007 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | <0.001 | 0.004 |
| 137Ba | 0.001 | 0.003 | 1.7 | 1.9 | 2.5 | 1.5 | 2.7 | 3.2 | 2.8 | 2.4 | 1.9 | 3.6 |
| 202Hg | 0.033 | 0.110 | 0.039 | <0.033 | 0.035 | <0.033 | <0.033 | <0.033 | 0.050 | 0.247 | <0.033 | 0.038 |
| 205Tl | 0.001 | 0.003 | 0.005 | 0.003 | 0.004 | 0.006 | 0.009 | 0.001 | 0.003 | 0.004 | 0.003 | <0.001 |
| 208Pb | 0.001 | 0.003 | 0.004 | 0.009 | 0.004 | 0.003 | 0.003 | 0.004 | 0.007 | 0.003 | 0.003 | 0.004 |
| 238U | 0.001 | 0.003 | 0.002 | 0.005 | 0.007 | 0.003 | 0.005 | <0.001 | 0.001 | 0.003 | 0.001 | <0.001 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | LNLK-12 | LNLK-13 | LNLK-14 | LNLK-15 | LNLK-16 | LNLK-17 | LNLK-18 | LNLK-19 | LNLK-20 | ERWSF-1 |
|----------------------|----------|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Laboratory Sample ID | | | 031 | 032 | 033 | 034 | 035 | 036 | 037 | 038 | 039 | 040 |
| Wet Weight (mg) | | | 74.3 | 117.5 | 147.3 | 162.5 | 307.5 | 135.0 | 164.1 | 221.4 | 200.0 | 18.6 |
| Dry Weight (mg) | | | 35.9 | 55.3 | 65.7 | 62.9 | 125.3 | 56.5 | 72.3 | 93.1 | 86.5 | 10.7 |
| Moisture (%) | | | 51.7 | 52.9 | 55.4 | 61.3 | 59.3 | 58.1 | 55.9 | 57.9 | 56.8 | 42.5 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.009 | 0.014 | 0.014 | 0.011 | 0.009 | 0.009 | 0.008 | 0.014 | 0.010 | <0.005 |
| 11B | 0.096 | 0.320 | <0.096 | <0.096 | <0.096 | 0.107 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 |
| 23Na | 3.1 | 10.3 | 2,220 | 2,558 | 2,621 | 2,932 | 2,544 | 2,171 | 1,659 | 2,104 | 2,508 | 1,970 |
| 24Mg | 0.069 | 0.230 | 772 | 761 | 541 | 784 | 697 | 868 | 688 | 665 | 643 | 733 |
| 27Al | 0.060 | 0.2 | 0.823 | 1.7 | 1.1 | 1.5 | 0.617 | 1.1 | 0.454 | 0.698 | 0.531 | 2.1 |
| 31P | 52 | 173 | 12,826 | 12,809 | 11,839 | 11,982 | 11,058 | 11,906 | 11,399 | 11,631 | 12,211 | 11,038 |
| 39K | 0.992 | 3.3 | 7,953 | 8,833 | 7,734 | 7,488 | 7,209 | 7,508 | 7,202 | 8,073 | 8,393 | 7,615 |
| 44Ca | 10 | 33 | 343 | 413 | 364 | 469 | 335 | 420 | 280 | 308 | 321 | 268 |
| 49Ti | 0.158 | 0.5 | 0.751 | 0.845 | 0.845 | 0.939 | 0.657 | 0.939 | 0.657 | 0.751 | 0.657 | 0.657 |
| 51V | 0.030 | 0.100 | <0.030 | 0.036 | 0.039 | 0.038 | <0.030 | <0.030 | <0.030 | 0.031 | <0.030 | <0.030 |
| 52Cr | 0.099 | 0.330 | 1.5 | 1.7 | 1.6 | 1.7 | 1.3 | 1.5 | 1.2 | 1.5 | 1.4 | 1.6 |
| 55Mn | 0.013 | 0.043 | 6.5 | 5.3 | 6.9 | 4.9 | 5.5 | 7.3 | 5.2 | 5.0 | 4.4 | 2.7 |
| 57Fe | 0.793 | 2.6 | 31 | 40 | 35 | 37 | 33 | 43 | 27 | 28 | 36 | 24 |
| 59Co | 0.003 | 0.010 | 0.050 | 0.062 | 0.049 | 0.065 | 0.036 | 0.048 | 0.030 | 0.061 | 0.041 | 0.036 |
| 60Ni | 0.013 | 0.043 | 0.172 | 0.621 | 0.343 | 0.421 | 0.098 | 0.360 | 0.082 | 0.323 | 0.172 | 0.319 |
| 63Cu | 0.005 | 0.017 | 4.1 | 5.1 | 3.9 | 4.5 | 4.6 | 4.5 | 3.7 | 3.9 | 4.0 | 5.2 |
| 66Zn | 0.232 | 0.773 | 93 | 91 | 87 | 81 | 76 | 96 | 80 | 81 | 71 | 86 |
| 75As | 0.420 | 1.4 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 |
| 77Se | 0.320 | 1.1 | 0.846 | 1.1 | 1.0 | 1.1 | 0.904 | 1.1 | 1.0 | 1.2 | 1.1 | 6.9 |
| 88Sr | 0.001 | 0.003 | 0.273 | 0.259 | 0.231 | 0.268 | 0.183 | 0.269 | 0.171 | 0.218 | 0.203 | 0.147 |
| 95Mo | 0.001 | 0.003 | 0.057 | 0.057 | 0.057 | 0.071 | 0.057 | 0.078 | 0.050 | 0.042 | 0.071 | 0.050 |
| 107Ag | 0.001 | 0.003 | 0.026 | 0.011 | 0.014 | 0.009 | 0.016 | 0.032 | 0.039 | 0.044 | 0.021 | 0.063 |
| 111Cd | 0.043 | 0.143 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | 0.043 | <0.043 | 0.043 | <0.043 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.431 | 0.230 | 0.457 | 0.375 | 0.161 | 0.200 | 0.294 | 0.215 | 0.340 | 0.081 |
| 121Sb | 0.001 | 0.003 | 0.003 | <0.001 | <0.001 | 0.003 | <0.001 | <0.001 | <0.001 | <0.001 | 0.003 | 0.003 |
| 137Ba | 0.001 | 0.003 | 3.6 | 2.5 | 2.1 | 1.5 | 2.1 | 5.5 | 2.6 | 2.8 | 2.1 | 0.396 |
| 202Hg | 0.033 | 0.110 | <0.033 | <0.033 | <0.033 | <0.033 | <0.033 | 0.046 | 0.431 | <0.033 | <0.033 | <0.033 |
| 205Tl | 0.001 | 0.003 | 0.001 | 0.002 | <0.001 | 0.001 | 0.001 | <0.001 | <0.001 | 0.002 | 0.001 | 0.002 |
| 208Pb | 0.001 | 0.003 | 0.007 | 0.003 | 0.003 | 0.004 | 0.003 | 0.003 | 0.001 | 0.003 | 0.001 | 0.005 |
| 238U | 0.001 | 0.003 | <0.001 | <0.001 | <0.001 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | ERWSF-2 | ERWSF-3 | ER-01 | ER-02 | ER-03 | ER-04 | ER-05 | ER-05-Dup | ER-06 | ER-07 |
|----------------------|----------|-----------|---------|---------|--------|--------|--------|--------|--------|-----------|--------|--------|
| Laboratory Sample ID | | | 041 | 042 | 043 | 044 | 045 | 046 | 047 | 048 | 049 | 050 |
| Wet Weight (mg) | | | 39.5 | 9.5 | 94.5 | 184.4 | 231.6 | 39.6 | 264.7 | 260.1 | 40.8 | 106.3 |
| Dry Weight (mg) | | | 19.1 | 5.7 | 51.4 | 97.9 | 94.8 | 25.0 | 117.2 | 118.5 | 30.5 | 53.7 |
| Moisture (%) | | | 51.6 | 40.0 | 45.6 | 46.9 | 59.1 | 36.9 | 55.7 | 54.4 | 25.2 | 49.5 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.011 | 0.006 | 0.023 | 0.009 | 0.016 | 0.015 | 0.016 | 0.015 | 0.014 | 0.014 |
| 11B | 0.096 | 0.320 | 0.125 | 0.179 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | 0.114 | <0.096 |
| 23Na | 3.1 | 10.3 | 2,645 | 2,168 | 2,332 | 1,688 | 2,265 | 2,245 | 2,386 | 2,797 | 2,438 | 2,101 |
| 24Mg | 0.069 | 0.230 | 976 | 663 | 636 | 605 | 698 | 716 | 785 | 763 | 893 | 912 |
| 27Al | 0.060 | 0.2 | 2.8 | 2.1 | 1.1 | 0.424 | 0.398 | 0.505 | 0.874 | 0.773 | 1.3 | 1.1 |
| 31P | 52 | 173 | 13,599 | 10,077 | 10,826 | 10,042 | 11,471 | 11,154 | 11,944 | 12,835 | 14,288 | 13,282 |
| 39K | 0.992 | 3.3 | 8,944 | 7,684 | 7,763 | 6,313 | 7,187 | 8,130 | 7,502 | 9,252 | 9,874 | 8,367 |
| 44Ca | 10 | 33 | 354 | 312 | 468 | 303 | 321 | 324 | 457 | 401 | 325 | 300 |
| 49Ti | 0.158 | 0.5 | 0.892 | 0.845 | 0.657 | 0.469 | 0.563 | 0.751 | 0.657 | 0.723 | 1.0 | 0.890 |
| 51V | 0.030 | 0.100 | 0.048 | <0.030 | 0.033 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | 0.044 | <0.030 |
| 52Cr | 0.099 | 0.330 | 2.2 | 1.3 | 1.6 | 1.1 | 1.2 | 1.3 | 1.4 | 1.3 | 1.9 | 1.5 |
| 55Mn | 0.013 | 0.043 | 5.1 | 3.9 | 4.5 | 2.6 | 4.1 | 4.2 | 7.9 | 8.3 | 5.8 | 5.8 |
| 57Fe | 0.793 | 2.6 | 87 | 36 | 37 | 33 | 30 | 30 | 38 | 43 | 55 | 46 |
| 59Co | 0.003 | 0.010 | 0.085 | 0.036 | 0.056 | 0.032 | 0.029 | 0.037 | 0.044 | 0.058 | 0.075 | 0.068 |
| 60Ni | 0.013 | 0.043 | 0.928 | 0.172 | 0.601 | 0.041 | 0.041 | 0.131 | 0.155 | 0.153 | 0.700 | 0.233 |
| 63Cu | 0.005 | 0.017 | 4.6 | 2.4 | 3.7 | 3.4 | 3.4 | 4.4 | 4.1 | 4.3 | 4.4 | 3.6 |
| 66Zn | 0.232 | 0.773 | 100 | 62 | 82 | 83 | 80 | 79 | 77 | 82 | 101 | 113 |
| 75As | 0.420 | 1.4 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | 0.451 |
| 77Se | 0.320 | 1.1 | 5.8 | 5.1 | 7.0 | 5.6 | 7.9 | 8.9 | 6.9 | 6.8 | 8.9 | 6.7 |
| 88Sr | 0.001 | 0.003 | 0.200 | 0.140 | 0.296 | 0.230 | 0.248 | 0.210 | 0.244 | 0.209 | 0.275 | 0.242 |
| 95Mo | 0.001 | 0.003 | 0.106 | 0.042 | 0.057 | 0.042 | 0.021 | 0.021 | 0.064 | 0.057 | 0.043 | 0.057 |
| 107Ag | 0.001 | 0.003 | 0.053 | 0.044 | 0.028 | 0.012 | 0.012 | 0.023 | 0.016 | 0.017 | 0.024 | 0.021 |
| 111Cd | 0.043 | 0.143 | 0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | 0.055 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.552 | 0.255 | 0.072 | 0.069 | 0.161 | 0.027 | 0.263 | 0.309 | 0.119 | 0.215 |
| 121Sb | 0.001 | 0.003 | 0.008 | 0.005 | 0.003 | 0.003 | <0.001 | <0.001 | 0.003 | 0.003 | 0.003 | <0.001 |
| 137Ba | 0.001 | 0.003 | 0.692 | 0.415 | 0.455 | 0.356 | 0.396 | 0.554 | 0.494 | 0.371 | 0.515 | 0.968 |
| 202Hg | 0.033 | 0.110 | <0.033 | 0.061 | 0.158 | <0.033 | <0.033 | 0.122 | <0.033 | 0.049 | <0.033 | <0.033 |
| 205Tl | 0.001 | 0.003 | 0.003 | 0.003 | 0.005 | 0.003 | 0.004 | 0.005 | 0.005 | 0.008 | 0.017 | 0.020 |
| 208Pb | 0.001 | 0.003 | 0.009 | 0.004 | 0.003 | 0.001 | 0.001 | 0.001 | 0.005 | 0.006 | 0.004 | 0.001 |
| 238U | 0.001 | 0.003 | <0.001 | <0.001 | 0.002 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue Analysis

| Client Sample ID | | | ER-07-Dup | ER-08 | ER-08-Dup | ER-09 | ER-10 | ER-11 | ER-12 | ER-13 | ER-14-Dup 1 | ER-14-Dup 2 |
|----------------------|----------|-----------|-----------|--------|-----------|--------|--------|--------|--------|--------|-------------|-------------|
| Laboratory Sample ID | | | 051 | 052 | 053 | 054 | 055 | 056 | 057 | 058 | 059 | 060 |
| Wet Weight (mg) | | | 67.4 | 171.7 | 181.9 | 333.9 | 32.0 | 74.3 | 197.0 | 228.9 | 142.2 | 250.8 |
| Dry Weight (mg) | | | 34.6 | 73.8 | 82.7 | 139.2 | 20.8 | 32.6 | 86.5 | 89.8 | 56.7 | 92.1 |
| Moisture (%) | | | 48.7 | 57.0 | 54.5 | 58.3 | 35.0 | 56.1 | 56.1 | 60.8 | 60.1 | 63.3 |
| Parameter | DL (ppm) | LOQ (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) | (ppm) |
| 7Li | 0.005 | 0.017 | 0.012 | 0.012 | 0.014 | 0.014 | 0.016 | 0.009 | 0.016 | 0.012 | 0.014 | 0.016 |
| 11B | 0.096 | 0.320 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 | <0.096 |
| 23Na | 3.1 | 10.3 | 2,071 | 2,689 | 2,820 | 3,048 | 2,393 | 1,828 | 2,512 | 2,612 | 2,264 | 2,893 |
| 24Mg | 0.069 | 0.230 | 887 | 694 | 731 | 798 | 692 | 736 | 693 | 798 | 797 | 778 |
| 27Al | 0.060 | 0.2 | 0.687 | 1.2 | 1.3 | 0.346 | 0.664 | 0.650 | 0.428 | 0.511 | 0.849 | 1.4 |
| 31P | 52 | 173 | 13,187 | 12,643 | 13,427 | 14,021 | 11,830 | 11,538 | 12,343 | 13,240 | 11,874 | 13,145 |
| 39K | 0.992 | 3.3 | 9,489 | 8,637 | 9,685 | 9,191 | 7,078 | 7,883 | 9,151 | 9,038 | 7,811 | 8,776 |
| 44Ca | 10 | 33 | 272 | 266 | 291 | 339 | 282 | 241 | 302 | 345 | 351 | 361 |
| 49Ti | 0.158 | 0.5 | 0.779 | 0.890 | 0.779 | 1.0 | 0.723 | 0.667 | 0.667 | 0.637 | 0.637 | 0.820 |
| 51V | 0.030 | 0.100 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | <0.030 | 0.033 |
| 52Cr | 0.099 | 0.330 | 1.3 | 1.3 | 1.5 | 1.5 | 1.3 | 1.1 | 1.2 | 1.3 | 1.3 | 1.5 |
| 55Mn | 0.013 | 0.043 | 5.9 | 3.4 | 3.8 | 5.8 | 5.5 | 6.2 | 5.9 | 5.9 | 4.1 | 4.1 |
| 57Fe | 0.793 | 2.6 | 36 | 32 | 36 | 43 | 27 | 31 | 32 | 36 | 35 | 36 |
| 59Co | 0.003 | 0.010 | 0.058 | 0.041 | 0.045 | 0.071 | 0.047 | 0.046 | 0.019 | 0.033 | 0.042 | 0.053 |
| 60Ni | 0.013 | 0.043 | 0.081 | 0.103 | 0.135 | 0.108 | 0.126 | 0.189 | 0.072 | 0.032 | 0.287 | 0.186 |
| 63Cu | 0.005 | 0.017 | 3.2 | 4.1 | 4.5 | 3.9 | 3.4 | 3.5 | 3.7 | 4.5 | 3.5 | 4.0 |
| 66Zn | 0.232 | 0.773 | 104 | 78 | 84 | 88 | 74 | 78 | 76 | 79 | 75 | 77 |
| 75As | 0.420 | 1.4 | 0.476 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 | <0.420 |
| 77Se | 0.320 | 1.1 | 6.8 | 8.2 | 9.0 | 9.7 | 4.8 | 6.1 | 8.8 | 10 | 6.9 | 7.0 |
| 88Sr | 0.001 | 0.003 | 0.203 | 0.323 | 0.329 | 0.251 | 0.224 | 0.233 | 0.197 | 0.286 | 0.273 | 0.263 |
| 95Mo | 0.001 | 0.003 | 0.050 | 0.043 | 0.050 | 0.036 | 0.043 | 0.036 | 0.036 | 0.041 | 0.041 | 0.034 |
| 107Ag | 0.001 | 0.003 | 0.019 | 0.019 | 0.021 | 0.019 | 0.011 | 0.017 | 0.017 | 0.030 | 0.018 | 0.018 |
| 111Cd | 0.043 | 0.143 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | <0.043 | 0.054 | <0.043 |
| 118Sn | 0.011 | 0.037 | 0.235 | 0.384 | 0.290 | 0.205 | 0.168 | 0.195 | 0.057 | 0.407 | 0.274 | 0.255 |
| 121Sb | 0.001 | 0.003 | <0.001 | 0.003 | 0.003 | 0.003 | <0.001 | <0.001 | <0.001 | 0.003 | 0.003 | 0.003 |
| 137Ba | 0.001 | 0.003 | 0.824 | 0.515 | 0.556 | 0.535 | 0.597 | 0.535 | 0.309 | 0.460 | 0.570 | 0.570 |
| 202Hg | 0.033 | 0.110 | <0.033 | <0.033 | <0.033 | <0.033 | <0.033 | 0.640 | <0.033 | <0.033 | <0.033 | <0.033 |
| 205Tl | 0.001 | 0.003 | 0.018 | 0.009 | 0.010 | 0.018 | 0.009 | 0.009 | 0.009 | 0.010 | 0.010 | 0.010 |
| 208Pb | 0.001 | 0.003 | 0.001 | 0.003 | 0.004 | 0.003 | 0.001 | 0.001 | 0.001 | 0.003 | 0.001 | 0.004 |
| 238U | 0.001 | 0.003 | <0.001 | 0.001 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

Notes:

ppm = parts per million

DL = detection limit

LOQ = Limit of Quantification 10x signal to noise ratio

< = less than detection limit

mg = milligrams

% = percent

Date of Analysis: 26 May 2020

Teck Coal Limited - Fish Egg Tissue QA/QC Relative Percent Difference Results

| Client Sample ID | | STPD-02 | STPD-02 (Duplicate) | RPD | STPD-13 | STPD-13 (Duplicate) | RPD | ERIMF-10 | ERIMF-10 (Duplicate) | RPD |
|-----------------------|----------|---------|------------------------|------|---------|------------------------|-------------|----------|-------------------------|------|
| Laboratory Sample ID | | 002 | 002 (Duplicate) | | 013 | 013 (Duplicate) | | 023 | 023 (Duplicate) | |
| Total Dry Weight (mg) | | 89.8 | | | 10.5 | | | 42.6 | | |
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.005 | 0.023 | 0.030 | - | 0.062 | 0.058 | 6.7 | 0.014 | 0.014 | - |
| 11B | 0.096 | 0.112 | 0.106 | - | <0.096 | <0.096 | - | <0.096 | <0.096 | - |
| 23Na | 3.1 | 2,845 | 2,527 | 11.8 | 3,165 | 2,903 | 8.6 | 2,637 | 2,458 | 7.0 |
| 24Mg | 0.069 | 779 | 819 | 5.0 | 802 | 774 | 3.6 | 969 | 1,044 | 7.5 |
| 27Al | 0.060 | 2.4 | 3.6 | 40.0 | 5.4 | 3.8 | 34.8 | 2.0 | 1.7 | 16.2 |
| 31P | 52 | 12,864 | 12,301 | 4.5 | 13,040 | 11,267 | 14.6 | 12,641 | 13,087 | 3.5 |
| 39K | 0.992 | 9,399 | 8,074 | 15.2 | 9,031 | 7,906 | 13.3 | 9,867 | 9,393 | 4.9 |
| 44Ca | 10 | 385 | 391 | 1.5 | 411 | 363 | 12.4 | 420 | 443 | 5.3 |
| 49Ti | 0.158 | 0.738 | 0.922 | - | 1.1 | 0.922 | - | 1.3 | 0.952 | - |
| 51V | 0.030 | 0.035 | 0.042 | - | 0.071 | 0.039 | - | 0.046 | 0.044 | - |
| 52Cr | 0.099 | 1.9 | 2.1 | 10.0 | 3.4 | 2.7 | 23.0 | 2.0 | 2.1 | 4.9 |
| 55Mn | 0.013 | 5.5 | 5.2 | 5.6 | 3.8 | 3.4 | 11.1 | 8.3 | 8.4 | 1.2 |
| 57Fe | 0.793 | 58 | 55 | 5.3 | 69 | 57 | 19.0 | 41 | 38 | 7.6 |
| 59Co | 0.003 | 0.080 | 0.079 | 1.3 | 0.164 | 0.098 | 50.4 | 0.064 | 0.057 | 11.6 |
| 60Ni | 0.013 | 1.2 | 1.3 | 8.0 | 3.4 | 2.4 | 34.5 | 0.890 | 0.989 | 10.5 |
| 63Cu | 0.005 | 4.9 | 4.8 | 2.1 | 3.9 | 3.5 | 10.8 | 2.5 | 2.3 | 8.3 |
| 66Zn | 0.232 | 72 | 72 | 0.0 | 79 | 68 | 15.0 | 117 | 111 | 5.3 |
| 75As | 0.420 | <0.420 | <0.420 | - | <0.420 | <0.420 | - | <0.420 | <0.420 | - |
| 77Se | 0.320 | 22 | 21 | 4.7 | 23 | 21 | 9.1 | 5.0 | 5.0 | 0.0 |
| 88Sr | 0.001 | 0.319 | 0.397 | 21.8 | 0.396 | 0.376 | 5.2 | 0.273 | 0.271 | 0.7 |
| 95Mo | 0.001 | 0.055 | 0.048 | 13.6 | 0.055 | 0.041 | 29.2 | 0.082 | 0.074 | 10.3 |
| 107Ag | 0.001 | 0.039 | 0.037 | 5.3 | 0.037 | 0.035 | 5.6 | 0.015 | 0.013 | 14.3 |
| 111Cd | 0.043 | <0.043 | <0.043 | - | <0.043 | <0.043 | - | <0.043 | <0.043 | - |
| 118Sn | 0.011 | 0.198 | 0.289 | 37.4 | 0.378 | 0.295 | 24.7 | 0.239 | 0.183 | 26.5 |
| 121Sb | 0.001 | 0.003 | 0.003 | - | 0.005 | 0.003 | - | 0.003 | 0.003 | - |
| 137Ba | 0.001 | 0.799 | 0.763 | 4.6 | 0.999 | 0.954 | 4.6 | 2.5 | 2.3 | 8.3 |
| 202Hg | 0.033 | <0.033 | <0.033 | - | <0.033 | <0.033 | - | 0.035 | <0.033 | - |
| 205Tl | 0.001 | 0.009 | 0.008 | - | 0.005 | 0.004 | - | 0.004 | 0.004 | - |
| 208Pb | 0.001 | 0.004 | 0.003 | - | 0.007 | 0.004 | - | 0.004 | 0.004 | - |
| 238U | 0.001 | 0.001 | 0.001 | - | 0.001 | 0.001 | - | 0.007 | 0.006 | - |

Notes:

- ppm = parts per million
- RPD = Relative Percent Difference
- DL = detection limit
- < = less than detection limit
- % = percent
- mg = milligrams

Data Quality Objectives:

Laboratory Duplicates - RPD ≤40% for all elements, except Ca and Sr, which are ≤60%.
 Minimum DQOs apply to individual samples at concentrations above 10x DL.
Bold indicates DQO exceedance attributed to small sample size.

Teck Coal Limited - Fish Egg Tissue QA/QC Relative Percent Difference Results

| Client Sample ID | | LNLK-20 | LNLK-20 (Duplicate) | RPD | ER-07 | ER-07 (Duplicate) | RPD | ER-13 | ER-13 (Duplicate) | RPD |
|-----------------------|----------|---------|------------------------|-------------|--------|----------------------|-------------|--------|----------------------|------|
| Laboratory Sample ID | | 039 | 039 (Duplicate) | | 050 | 050 (Duplicate) | | 058 | 058 (Duplicate) | |
| Total Dry Weight (mg) | | 86.5 | | | 53.7 | | | 89.8 | | |
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.005 | 0.010 | 0.009 | - | 0.014 | 0.014 | - | 0.012 | 0.010 | - |
| 11B | 0.096 | <0.096 | <0.096 | - | <0.096 | 0.126 | - | <0.096 | <0.096 | - |
| 23Na | 3.1 | 2,508 | 2,409 | 4.0 | 2,101 | 2,334 | 10.5 | 2,612 | 2,759 | 5.5 |
| 24Mg | 0.069 | 643 | 694 | 7.6 | 912 | 962 | 5.3 | 798 | 799 | 0.1 |
| 27Al | 0.060 | 0.531 | 0.625 | - | 1.1 | 1.1 | 0.0 | 0.511 | 0.519 | - |
| 31P | 52 | 12,211 | 13,242 | 8.1 | 13,282 | 13,717 | 3.2 | 13,240 | 13,435 | 1.5 |
| 39K | 0.992 | 8,393 | 8,924 | 6.1 | 8,367 | 9,175 | 9.2 | 9,038 | 9,452 | 4.5 |
| 44Ca | 10 | 321 | 362 | 12.0 | 300 | 347 | 14.5 | 345 | 356 | 3.1 |
| 49Ti | 0.158 | 0.657 | 0.657 | - | 0.890 | 0.890 | - | 0.637 | 0.637 | - |
| 51V | 0.030 | <0.030 | <0.030 | - | <0.030 | <0.030 | - | <0.030 | <0.030 | - |
| 52Cr | 0.099 | 1.4 | 1.4 | 0.0 | 1.5 | 1.6 | 6.5 | 1.3 | 1.4 | 7.4 |
| 55Mn | 0.013 | 4.4 | 5.0 | 12.8 | 5.8 | 6.7 | 14.4 | 5.9 | 5.7 | 3.4 |
| 57Fe | 0.793 | 36 | 33 | 8.7 | 46 | 54 | 16.0 | 36 | 35 | 2.8 |
| 59Co | 0.003 | 0.041 | 0.043 | 4.8 | 0.068 | 0.074 | 8.5 | 0.033 | 0.031 | 6.3 |
| 60Ni | 0.013 | 0.172 | 0.212 | 20.8 | 0.233 | 0.305 | 26.8 | 0.032 | 0.040 | - |
| 63Cu | 0.005 | 4.0 | 4.3 | 7.2 | 3.6 | 4.0 | 10.5 | 4.5 | 4.5 | 0.0 |
| 66Zn | 0.232 | 71 | 79 | 10.7 | 113 | 121 | 6.8 | 79 | 80 | 1.3 |
| 75As | 0.420 | <0.420 | <0.420 | - | 0.451 | 0.464 | - | <0.420 | <0.420 | - |
| 77Se | 0.320 | 1.1 | 0.846 | - | 6.7 | 7.7 | 13.9 | 10 | 10 | 0.0 |
| 88Sr | 0.001 | 0.203 | 0.227 | 11.2 | 0.242 | 0.307 | 23.7 | 0.286 | 0.289 | 1.0 |
| 95Mo | 0.001 | 0.071 | 0.057 | 21.9 | 0.057 | 0.057 | 0.0 | 0.041 | 0.041 | 0.0 |
| 107Ag | 0.001 | 0.021 | 0.023 | 9.1 | 0.021 | 0.022 | 4.7 | 0.030 | 0.027 | 10.5 |
| 111Cd | 0.043 | <0.043 | <0.043 | - | <0.043 | 0.055 | - | <0.043 | <0.043 | - |
| 118Sn | 0.011 | 0.340 | 0.215 | 45.0 | 0.215 | 0.529 | 84.4 | 0.407 | 0.498 | 20.1 |
| 121Sb | 0.001 | 0.003 | 0.003 | - | <0.001 | 0.003 | - | 0.003 | 0.003 | - |
| 137Ba | 0.001 | 2.1 | 2.0 | 4.9 | 0.968 | 1.0 | 3.3 | 0.460 | 0.460 | 0.0 |
| 202Hg | 0.033 | <0.033 | <0.033 | - | <0.033 | <0.033 | - | <0.033 | <0.033 | - |
| 205Tl | 0.001 | 0.001 | 0.001 | - | 0.020 | 0.023 | 14.0 | 0.010 | 0.011 | 9.5 |
| 208Pb | 0.001 | 0.001 | 0.001 | - | 0.001 | 0.003 | - | 0.003 | 0.001 | - |
| 238U | 0.001 | <0.001 | <0.001 | - | <0.001 | <0.001 | - | <0.001 | <0.001 | - |

Notes:

- ppm = parts per million
- RPD = Relative Percent Difference
- DL = detection limit
- < = less than detection limit
- % = percent
- mg = milligrams

Data Quality Objectives:

Laboratory Duplicates - RPD ≤40% for all elements, except Ca and Sr, which are ≤60%.
 Minimum DQOs apply to individual samples at concentrations above 10x DL.
Bold indicates DQO exceedance attributed to small sample size.

Teck Coal Limited - Fish Egg Tissue QA/QC Relative Percent Difference Results

| Client Sample ID | | ER-14-Dup 1 | ER-14-Dup 1 (Duplicate) | RPD | ER-14-Dup 2 | ER-14-Dup 2 (Duplicate) | RPD |
|-----------------------|----------|-------------|----------------------------|------|-------------|----------------------------|------|
| Laboratory Sample ID | | 059 | 059 (Duplicate) | | 060 | 060 (Duplicate) | |
| Total Dry Weight (mg) | | 56.7 | | | 92.1 | | |
| Parameter | DL (ppm) | (ppm) | (ppm) | (%) | (ppm) | (ppm) | (%) |
| 7Li | 0.005 | 0.014 | 0.011 | - | 0.016 | 0.008 | - |
| 11B | 0.096 | <0.096 | <0.096 | - | <0.096 | <0.096 | - |
| 23Na | 3.1 | 2,264 | 2,189 | 3.4 | 2,893 | 1,958 | 38.5 |
| 24Mg | 0.069 | 797 | 729 | 8.9 | 778 | 715 | 8.4 |
| 27Al | 0.060 | 0.849 | 0.610 | - | 1.4 | 0.571 | - |
| 31P | 52 | 11,874 | 11,450 | 3.6 | 13,145 | 10,721 | 20.3 |
| 39K | 0.992 | 7,811 | 7,617 | 2.5 | 8,776 | 6,193 | 34.5 |
| 44Ca | 10 | 351 | 329 | 6.5 | 361 | 338 | 6.6 |
| 49Ti | 0.158 | 0.637 | 0.592 | - | 0.820 | 0.546 | - |
| 51V | 0.030 | <0.030 | <0.030 | - | 0.033 | <0.030 | - |
| 52Cr | 0.099 | 1.3 | 1.3 | 0.0 | 1.5 | 1.2 | 22.2 |
| 55Mn | 0.013 | 4.1 | 3.7 | 10.3 | 4.1 | 3.7 | 10.3 |
| 57Fe | 0.793 | 35 | 27 | 25.8 | 36 | 28 | 25.0 |
| 59Co | 0.003 | 0.042 | 0.038 | 10.0 | 0.053 | 0.036 | 38.2 |
| 60Ni | 0.013 | 0.287 | 0.129 | - | 0.186 | 0.049 | - |
| 63Cu | 0.005 | 3.5 | 3.4 | 2.9 | 4.0 | 3.2 | 22.2 |
| 66Zn | 0.232 | 75 | 68 | 9.8 | 77 | 68 | 12.4 |
| 75As | 0.420 | <0.420 | <0.420 | - | <0.420 | <0.420 | - |
| 77Se | 0.320 | 6.9 | 6.3 | 9.1 | 7.0 | 6.2 | 12.1 |
| 88Sr | 0.001 | 0.273 | 0.230 | 17.1 | 0.263 | 0.253 | 3.9 |
| 95Mo | 0.001 | 0.041 | 0.034 | 18.7 | 0.034 | 0.027 | 23.0 |
| 107Ag | 0.001 | 0.018 | 0.018 | 0.0 | 0.018 | 0.016 | 11.8 |
| 111Cd | 0.043 | 0.054 | <0.043 | - | <0.043 | <0.043 | - |
| 118Sn | 0.011 | 0.274 | 0.282 | 2.9 | 0.255 | 0.070 | - |
| 121Sb | 0.001 | 0.003 | 0.003 | - | 0.003 | <0.001 | - |
| 137Ba | 0.001 | 0.570 | 0.478 | 17.6 | 0.570 | 0.460 | 21.4 |
| 202Hg | 0.033 | <0.033 | <0.033 | - | <0.033 | <0.033 | - |
| 205Tl | 0.001 | 0.010 | 0.009 | - | 0.010 | 0.008 | - |
| 208Pb | 0.001 | 0.001 | 0.001 | - | 0.004 | 0.001 | - |
| 238U | 0.001 | <0.001 | <0.001 | - | <0.001 | <0.001 | - |

Notes:

- ppm = parts per million
- RPD = Relative Percent Difference
- DL = detection limit
- < = less than detection limit
- % = percent
- mg = milligrams

Data Quality Objectives:

Laboratory Duplicates - RPD ≤40% for all elements, except Ca and Sr, which are ≤60%.
 Minimum DQOs apply to individual samples at concentrations above 10x DL.

Teck Coal Limited - Fish Egg Tissue QA/QC Accuracy and Precision Results

| Accuracy/Precision (Samples 001 to 018) | | | | | | | | | | |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|-------------------|
| Parameter | Detection Limit (ppm) | Certified Value (ppm) | Observed Conc. 1 (ppm) | Observed Conc. 2 (ppm) | Observed Conc. 3 (ppm) | Observed Conc. 4 (ppm) | Observed Conc. 5 (ppm) | Mean Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 0.005 | 1.21 | 1.5 | 1.5 | 1.2 | 1.3 | 1.5 | 1.4 | 115 | 7.5 |
| 11B | 0.096 | 4.5 | 4.7 | 4.8 | 4.6 | 4.6 | 4.8 | 4.7 | 105 | 2.3 |
| 23Na | 3.1 | 14,000 | 16,962 | 17,152 | 14,905 | 16,355 | 16,938 | 16,463 | 118 | 5.6 |
| 24Mg | 0.069 | 910 | 1,057 | 1,049 | 948 | 1,064 | 1,090 | 1,042 | 114 | 5.2 |
| 27Al | 0.060 | 197 | 212 | 187 | 180 | 204 | 195 | 196 | 99 | 6.5 |
| 31P | 52 | 8,000 | 8,875 | 9,088 | 8,330 | 9,354 | 9,315 | 8,992 | 112 | 4.6 |
| 39K | 0.992 | 15,500 | 17,844 | 18,463 | 15,724 | 18,989 | 18,467 | 17,897 | 116 | 7.2 |
| 44Ca | 10 | 2,360 | 2,552 | 2,538 | 2,379 | 2,649 | 2,548 | 2,533 | 107 | 3.8 |
| 49Ti | 0.158 | 12.24 | 13 | 14 | 11 | 12 | 11 | 12 | 100 | 9.3 |
| 51V | 0.030 | 1.57 | 1.6 | 1.9 | 1.6 | 2.0 | 1.7 | 1.8 | 113 | 10.0 |
| 52Cr | 0.099 | 1.87 | 2.0 | 2.1 | 1.9 | 2.1 | 2.1 | 2.0 | 109 | 3.8 |
| 55Mn | 0.013 | 3.17 | 3.5 | 3.6 | 3.3 | 3.8 | 3.6 | 3.6 | 112 | 5.1 |
| 57Fe | 0.793 | 343 | 399 | 404 | 365 | 414 | 391 | 395 | 115 | 4.7 |
| 59Co | 0.003 | 0.25 | 0.291 | 0.300 | 0.272 | 0.308 | 0.305 | 0.295 | 118 | 5.0 |
| 60Ni | 0.013 | 1.34 | 1.6 | 1.6 | 1.4 | 1.5 | 1.6 | 1.6 | 116 | 5.5 |
| 63Cu | 0.005 | 15.7 | 18 | 18 | 17 | 19 | 19 | 18 | 116 | 4.6 |
| 66Zn | 0.232 | 51.6 | 63 | 63 | 59 | 60 | 61 | 61 | 118 | 2.9 |
| 75As | 0.420 | 6.87 | 8.0 | 7.9 | 7.0 | 7.8 | 8.0 | 7.7 | 112 | 5.8 |
| 77Se | 0.320 | 3.45 | 3.9 | 3.9 | 3.5 | 3.7 | 3.9 | 3.8 | 110 | 5.4 |
| 88Sr | 0.001 | 10.1 | 12 | 12 | 10 | 12 | 12 | 11 | 113 | 4.6 |
| 95Mo | 0.001 | 0.29 | 0.352 | 0.380 | 0.304 | 0.325 | 0.331 | 0.338 | 117 | 8.5 |
| 107Ag | 0.001 | 0.0252 | 0.035 | 0.030 | 0.028 | 0.031 | 0.030 | 0.031 | 122 | 9.1 |
| 111Cd | 0.043 | 0.299 | 0.363 | 0.386 | 0.375 | 0.352 | 0.386 | 0.372 | 125 | 4.0 |
| 118Sn | 0.011 | 0.061 | 0.069 | 0.069 | 0.061 | 0.088 | 0.076 | 0.072 | 119 | 14.0 |
| 121Sb | 0.001 | 0.011 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 92 | 0.0 |
| 137Ba | 0.001 | 8.6 | 8.2 | 8.4 | 8.6 | 8.8 | 8.4 | 8.5 | 98 | 2.8 |
| 202Hg | 0.033 | 0.412 | 0.521 | 0.495 | 0.462 | 0.467 | 0.475 | 0.484 | 118 | 5.0 |
| 205Tl | - | - | - | - | - | - | - | - | - | - |
| 208Pb | 0.001 | 0.404 | 0.372 | 0.460 | 0.431 | 0.551 | 0.400 | 0.443 | 110 | 16.0 |
| 238U | 0.001 | 0.05 | 0.051 | 0.059 | 0.051 | 0.060 | 0.053 | 0.055 | 110 | 7.5 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: DQO of 60 - 140% of the certified values for B, Ti, Ag, Sn, Sb, and Ba.

Accuracy: DQO of 90 - 110% of the certified values for Se.

Accuracy: DQO of 70 - 130% of the certified values for all other elements provided.

Precision: DQO of $\leq 20\%$ was established for all elements.

DORM-4 used for all elements except B, Ti, Sb, Ba, and Al where NIST-1566b was used.

Teck Coal Limited - Fish Egg Tissue QA/QC Accuracy and Precision Results

| Accuracy/Precision (Samples 019 to 029) | | | | | | | | | | |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|-------------------|
| Parameter | Detection Limit (ppm) | Certified Value (ppm) | Observed Conc. 1 (ppm) | Observed Conc. 2 (ppm) | Observed Conc. 3 (ppm) | Observed Conc. 4 (ppm) | Observed Conc. 5 (ppm) | Mean Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 0.005 | 1.21 | 1.4 | 1.3 | 1.5 | 1.4 | 1.3 | 1.4 | 114 | 6.0 |
| 11B | 0.096 | 4.5 | 5.5 | 5.4 | 5.7 | 5.1 | 5.1 | 5.4 | 119 | 5.1 |
| 23Na | 3.1 | 14,000 | 16,681 | 15,101 | 15,458 | 15,291 | 16,462 | 15,798 | 113 | 4.6 |
| 24Mg | 0.069 | 910 | 1,102 | 1,065 | 1,074 | 1,158 | 1,102 | 1,100 | 121 | 3.3 |
| 27Al | 0.060 | 197.2 | 190 | 189 | 202 | 172 | 179 | 186 | 94 | 6.2 |
| 31P | 52 | 8,000 | 8,771 | 9,004 | 8,872 | 8,988 | 9,405 | 9,008 | 113 | 2.7 |
| 39K | 0.992 | 15,500 | 19,032 | 17,251 | 17,987 | 18,667 | 19,877 | 18,563 | 120 | 5.4 |
| 44Ca | 10 | 2,360 | 2,775 | 2,719 | 2,807 | 2,739 | 2,808 | 2,770 | 117 | 1.5 |
| 49Ti | 0.158 | 12.24 | 13 | 15 | 13 | 12 | 14 | 13 | 107 | 7.7 |
| 51V | 0.030 | 1.57 | 1.9 | 1.7 | 1.6 | 1.7 | 2.0 | 1.8 | 114 | 7.9 |
| 52Cr | 0.099 | 1.87 | 2.2 | 2.2 | 2.2 | 2.1 | 2.2 | 2.2 | 116 | 2.5 |
| 55Mn | 0.013 | 3.17 | 3.9 | 3.9 | 4.0 | 3.9 | 4.1 | 4.0 | 125 | 2.0 |
| 57Fe | 0.793 | 343 | 446 | 439 | 427 | 419 | 432 | 432 | 126 | 2.4 |
| 59Co | 0.003 | 0.25 | 0.319 | 0.324 | 0.308 | 0.308 | 0.332 | 0.318 | 127 | 3.3 |
| 60Ni | 0.013 | 1.34 | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | 128 | 4.0 |
| 63Cu | 0.005 | 15.7 | 21 | 21 | 19 | 20 | 20 | 20 | 128 | 3.0 |
| 66Zn | 0.232 | 51.6 | 60 | 63 | 62 | 63 | 61 | 62 | 120 | 2.1 |
| 75As | 0.420 | 6.87 | 7.6 | 7.7 | 7.6 | 7.8 | 7.8 | 7.7 | 112 | 1.2 |
| 77Se | 0.320 | 3.45 | 3.7 | 3.6 | 3.5 | 3.7 | 3.6 | 3.6 | 104 | 2.4 |
| 88Sr | 0.001 | 10.1 | 12 | 12 | 12 | 12 | 12 | 12 | 118 | 2.1 |
| 95Mo | 0.001 | 0.29 | 0.372 | 0.364 | 0.379 | 0.364 | 0.357 | 0.367 | 127 | 2.3 |
| 107Ag | 0.001 | 0.0252 | 0.037 | 0.033 | 0.031 | 0.031 | 0.033 | 0.033 | 132 | 6.8 |
| 111Cd | 0.043 | 0.299 | 0.417 | 0.386 | 0.391 | 0.355 | 0.355 | 0.381 | 127 | 7.0 |
| 118Sn | 0.011 | 0.061 | 0.080 | 0.069 | 0.067 | 0.074 | 0.079 | 0.074 | 121 | 7.8 |
| 121Sb | 0.001 | 0.011 | 0.017 | 0.013 | 0.012 | 0.013 | 0.010 | 0.013 | 117 | 19.0 |
| 137Ba | 0.001 | 8.6 | 9.2 | 8.8 | 9.5 | 9.2 | 8.1 | 9.0 | 104 | 5.9 |
| 202Hg | 0.033 | 0.412 | 0.489 | 0.500 | 0.516 | 0.502 | 0.491 | 0.500 | 121 | 2.2 |
| 205Tl | - | - | - | - | - | - | - | - | - | - |
| 208Pb | 0.001 | 0.404 | 0.618 | 0.625 | 0.475 | 0.484 | 0.514 | 0.543 | 134 | 14.0 |
| 238U | 0.001 | 0.05 | 0.071 | 0.059 | 0.056 | 0.056 | 0.065 | 0.061 | 123 | 11.0 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: DQO of 60 - 140% of the certified values for B, Ti, Ag, Sn, Sb, and Ba.

Accuracy: DQO of 90 - 110% of the certified values for Se.

Accuracy: DQO of 70 - 130% of the certified values for all other elements provided.

Precision: DQO of $\leq 20\%$ was established for all elements.

DORM-4 used for all elements except B, Ti, Sb, Ba, and Al where NIST-1566b was used.

Bold indicates DQO exceedance, but result is accepted as it does not impact the reportable results.

Teck Coal Limited - Fish Egg Tissue QA/QC Accuracy and Precision Results

| Accuracy/Precision (Samples 030 to 047) | | | | | | | | | | |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|-------------------|
| Parameter | Detection Limit (ppm) | Certified Value (ppm) | Observed Conc. 1 (ppm) | Observed Conc. 2 (ppm) | Observed Conc. 3 (ppm) | Observed Conc. 4 (ppm) | Observed Conc. 5 (ppm) | Mean Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 0.005 | 1.21 | 1.5 | 1.4 | 1.6 | 1.3 | 1.5 | 1.5 | 121 | 7.1 |
| 11B | 0.096 | 4.5 | 5.3 | 5.3 | 5.2 | 5.6 | 5.4 | 5.3 | 118 | 2.7 |
| 23Na | 3.1 | 14,000 | 16,547 | 15,501 | 15,809 | 15,445 | 15,090 | 15,678 | 112 | 3.5 |
| 24Mg | 0.069 | 910 | 1,061 | 1,002 | 1,025 | 1,021 | 950 | 1,012 | 111 | 4.0 |
| 27Al | 0.060 | 197.2 | 209 | 226 | 220 | 221 | 210 | 217 | 110 | 3.4 |
| 31P | 52 | 8,000 | 9,647 | 8,853 | 9,011 | 8,792 | 8,396 | 8,940 | 112 | 5.1 |
| 39K | 0.992 | 15,500 | 17,884 | 18,501 | 17,833 | 16,948 | 17,293 | 17,692 | 114 | 3.4 |
| 44Ca | 10 | 2,360 | 2,857 | 2,697 | 2,695 | 2,635 | 2,583 | 2,694 | 114 | 3.8 |
| 49Ti | 0.158 | 12.24 | 12 | 14 | 13 | 12 | 12 | 13 | 104 | 5.8 |
| 51V | 0.030 | 1.57 | 1.8 | 1.8 | 1.7 | 1.6 | 1.5 | 1.7 | 107 | 9.4 |
| 52Cr | 0.099 | 1.87 | 2.3 | 2.1 | 2.1 | 2.1 | 1.9 | 2.1 | 113 | 6.6 |
| 55Mn | 0.013 | 3.17 | 4.0 | 3.7 | 3.8 | 3.6 | 3.5 | 3.7 | 118 | 4.8 |
| 57Fe | 0.793 | 343 | 427 | 400 | 403 | 395 | 381 | 401 | 117 | 4.2 |
| 59Co | 0.003 | 0.25 | 0.323 | 0.297 | 0.296 | 0.286 | 0.281 | 0.297 | 119 | 5.4 |
| 60Ni | 0.013 | 1.34 | 1.7 | 1.6 | 1.6 | 1.6 | 1.5 | 1.6 | 120 | 5.3 |
| 63Cu | 0.005 | 15.7 | 19 | 19 | 20 | 19 | 19 | 19 | 123 | 2.5 |
| 66Zn | 0.232 | 51.6 | 68 | 62 | 64 | 62 | 62 | 64 | 124 | 4.0 |
| 75As | 0.420 | 6.87 | 7.9 | 7.4 | 7.4 | 7.5 | 7.4 | 7.5 | 109 | 2.7 |
| 77Se | 0.320 | 3.45 | 3.8 | 3.7 | 3.9 | 3.8 | 3.7 | 3.8 | 109 | 1.8 |
| 88Sr | 0.001 | 10.1 | 12 | 12 | 12 | 11 | 11 | 12 | 115 | 4.5 |
| 95Mo | 0.001 | 0.29 | 0.347 | 0.332 | 0.340 | 0.357 | 0.325 | 0.340 | 117 | 3.6 |
| 107Ag | 0.001 | 0.0252 | 0.032 | 0.028 | 0.033 | 0.028 | 0.030 | 0.030 | 120 | 7.6 |
| 111Cd | 0.043 | 0.299 | 0.444 | 0.376 | 0.405 | 0.367 | 0.338 | 0.386 | 129 | 10.0 |
| 118Sn | 0.011 | 0.061 | 0.084 | 0.085 | 0.075 | 0.075 | 0.071 | 0.078 | 128 | 8.0 |
| 121Sb | 0.001 | 0.011 | 0.011 | 0.011 | 0.014 | 0.014 | 0.011 | 0.012 | 110 | 12.0 |
| 137Ba | 0.001 | 8.6 | 9.8 | 10 | 9.5 | 10 | 9.8 | 9.9 | 115 | 2.8 |
| 202Hg | 0.033 | 0.412 | 0.586 | 0.508 | 0.536 | 0.519 | 0.536 | 0.537 | 130 | 5.6 |
| 205Tl | - | - | - | - | - | - | - | - | - | - |
| 208Pb | 0.001 | 0.404 | 0.546 | 0.45 | 0.485 | 0.517 | 0.341 | 0.468 | 116 | 17.0 |
| 238U | 0.001 | 0.05 | 0.070 | 0.064 | 0.061 | 0.063 | 0.052 | 0.062 | 124 | 11.0 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: DQO of 60 - 140% of the certified values for B, Ti, Ag, Sn, Sb, and Ba.

Accuracy: DQO of 90 - 110% of the certified values for Se.

Accuracy: DQO of 70 - 130% of the certified values for all other elements provided.

Precision: DQO of $\leq 20\%$ was established for all elements.

DORM-4 used for all elements except B, Ti, Sb, Ba, and Al where NIST-1566b was used.

Teck Coal Limited - Fish Egg Tissue QA/QC Accuracy and Precision Results

| Accuracy/Precision (Samples 048 to 057) | | | | | | | | | | |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|-------------------|
| Parameter | Detection Limit (ppm) | Certified Value (ppm) | Observed Conc. 1 (ppm) | Observed Conc. 2 (ppm) | Observed Conc. 3 (ppm) | Observed Conc. 4 (ppm) | Observed Conc. 5 (ppm) | Mean Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 0.005 | 1.21 | 1.3 | 1.4 | 1.4 | 1.3 | 1.5 | 1.4 | 113 | 6.2 |
| 11B | 0.096 | 4.5 | 5.3 | 5.4 | 4.4 | 4.4 | 5.0 | 4.9 | 109 | 9.5 |
| 23Na | 3.1 | 14,000 | 15,965 | 16,978 | 16,716 | 16,468 | 15,732 | 16,372 | 117 | 3.2 |
| 24Mg | 0.069 | 910 | 1,042 | 1,015 | 1,073 | 1,044 | 1,049 | 1,045 | 115 | 2.0 |
| 27Al | 0.060 | 197.2 | 194 | 190 | 180 | 186 | 181 | 186 | 94 | 3.1 |
| 31P | 52 | 8,000 | 9,184 | 9,430 | 9,492 | 9,203 | 9,028 | 9,267 | 116 | 2.1 |
| 39K | 0.992 | 15,500 | 18,265 | 18,117 | 19,935 | 18,278 | 17,001 | 18,319 | 118 | 5.7 |
| 44Ca | 10 | 2,360 | 2,761 | 2,749 | 2,785 | 2,629 | 2,618 | 2,708 | 115 | 2.9 |
| 49Ti | 0.158 | 12.24 | 12 | 13 | 13 | 12 | 13 | 13 | 103 | 4.4 |
| 51V | 0.030 | 1.57 | 1.9 | 1.7 | 2.0 | 1.8 | 1.6 | 1.8 | 113 | 9.8 |
| 52Cr | 0.099 | 1.87 | 2.2 | 2.1 | 2.2 | 2.1 | 2.1 | 2.2 | 115 | 2.6 |
| 55Mn | 0.013 | 3.17 | 4.0 | 3.7 | 4.0 | 3.8 | 3.9 | 3.9 | 123 | 3.1 |
| 57Fe | 0.793 | 343 | 424 | 410 | 435 | 419 | 418 | 421 | 123 | 2.2 |
| 59Co | 0.003 | 0.25 | 0.317 | 0.301 | 0.321 | 0.305 | 0.297 | 0.308 | 123 | 3.3 |
| 60Ni | 0.013 | 1.34 | 1.7 | 1.6 | 1.7 | 1.6 | 1.5 | 1.6 | 119 | 3.6 |
| 63Cu | 0.005 | 15.7 | 20 | 20 | 20 | 19 | 18 | 19 | 123 | 5.3 |
| 66Zn | 0.232 | 51.6 | 63 | 63 | 63 | 59 | 62 | 62 | 120 | 2.6 |
| 75As | 0.420 | 6.87 | 7.7 | 7.6 | 7.9 | 7.3 | 7.3 | 7.6 | 110 | 3.3 |
| 77Se | 0.320 | 3.45 | 3.7 | 3.8 | 3.9 | 3.8 | 3.7 | 3.8 | 110 | 2.4 |
| 88Sr | 0.001 | 10.1 | 13 | 12 | 12 | 12 | 12 | 12 | 120 | 2.6 |
| 95Mo | 0.001 | 0.29 | 0.362 | 0.369 | 0.334 | 0.305 | 0.320 | 0.338 | 117 | 8.1 |
| 107Ag | 0.001 | 0.0252 | 0.036 | 0.035 | 0.034 | 0.031 | 0.030 | 0.033 | 132 | 8.6 |
| 111Cd | 0.043 | 0.299 | 0.452 | 0.465 | 0.439 | 0.385 | 0.385 | 0.425 | 142 | 8.8 |
| 118Sn | 0.011 | 0.061 | 0.078 | 0.069 | 0.086 | 0.070 | 0.066 | 0.074 | 121 | 11.0 |
| 121Sb | 0.001 | 0.011 | 0.014 | 0.011 | 0.011 | 0.008 | 0.011 | 0.011 | 100 | 18.0 |
| 137Ba | 0.001 | 8.6 | 9.5 | 9.7 | 8.6 | 8.2 | 8.9 | 9.0 | 105 | 6.8 |
| 202Hg | 0.033 | 0.412 | 0.528 | 0.494 | 0.485 | 0.468 | 0.487 | 0.493 | 120 | 4.5 |
| 205Tl | - | - | - | - | - | - | - | - | - | - |
| 208Pb | 0.001 | 0.404 | 0.561 | 0.499 | 0.622 | 0.540 | 0.464 | 0.537 | 133 | 11.0 |
| 238U | 0.001 | 0.05 | 0.065 | 0.059 | 0.074 | 0.065 | 0.058 | 0.064 | 129 | 9.8 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: DQO of 60 - 140% of the certified values for B, Ti, Ag, Sn, Sb, and Ba.

Accuracy: DQO of 90 - 110% of the certified values for Se.

Accuracy: DQO of 70 - 130% of the certified values for all other elements provided.

Precision: DQO of $\leq 20\%$ was established for all elements.

DORM-4 used for all elements except B, Ti, Sb, Ba, and Al where NIST-1566b was used.

Bold indicates DQO exceedance, but result is accepted as it does not impact the reportable results.

Teck Coal Limited - Fish Egg Tissue QA/QC Accuracy and Precision Results

| Accuracy/Precision (Samples 058 to 060) | | | | | | | | | | |
|---|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|---------------------------|--------------|-------------------|
| Parameter | Detection Limit (ppm) | Certified Value (ppm) | Observed Conc. 1 (ppm) | Observed Conc. 2 (ppm) | Observed Conc. 3 (ppm) | Observed Conc. 4 (ppm) | Observed Conc. 5 (ppm) | Mean Observed Conc. (ppm) | Accuracy (%) | Precision RSD (%) |
| 7Li | 0.005 | 1.21 | 1.3 | 1.1 | 1.4 | 1.3 | 1.3 | 1.3 | 104 | 8.2 |
| 11B | 0.096 | 4.5 | 5.1 | 5.1 | 5.1 | 4.8 | 5.0 | 5.0 | 111 | 2.5 |
| 23Na | 3.1 | 14,000 | 15,738 | 14,935 | 15,911 | 15,246 | 16,171 | 15,600 | 111 | 3.2 |
| 24Mg | 0.069 | 910 | 948 | 893 | 982 | 945 | 1,022 | 958 | 105 | 5.0 |
| 27Al | 0.060 | 197.2 | 201 | 190 | 206 | 192 | 190 | 196 | 99 | 3.8 |
| 31P | 52 | 8,000 | 7,566 | 7,318 | 8,012 | 8,225 | 8,263 | 7,877 | 98 | 5.3 |
| 39K | 0.992 | 15,500 | 16,692 | 15,726 | 16,962 | 17,426 | 16,483 | 16,658 | 108 | 3.8 |
| 44Ca | 10 | 2,360 | 2,798 | 2,380 | 2,712 | 2,577 | 2,543 | 2,602 | 110 | 6.2 |
| 49Ti | 0.158 | 12.24 | 11 | 11 | 10 | 11 | 11 | 11 | 88 | 3.6 |
| 51V | 0.030 | 1.57 | 1.8 | 1.7 | 1.8 | 1.9 | 1.8 | 1.8 | 115 | 3.0 |
| 52Cr | 0.099 | 1.87 | 2.1 | 2.0 | 2.1 | 2.1 | 2.2 | 2.1 | 112 | 3.4 |
| 55Mn | 0.013 | 3.17 | 3.4 | 3.0 | 3.5 | 3.3 | 3.4 | 3.3 | 104 | 5.0 |
| 57Fe | 0.793 | 343 | 393 | 352 | 398 | 370 | 380 | 378 | 110 | 4.9 |
| 59Co | 0.003 | 0.25 | 0.286 | 0.271 | 0.291 | 0.286 | 0.275 | 0.282 | 113 | 2.9 |
| 60Ni | 0.013 | 1.34 | 1.5 | 1.4 | 1.6 | 1.5 | 1.5 | 1.5 | 113 | 4.3 |
| 63Cu | 0.005 | 15.7 | 19 | 17 | 19 | 18 | 17 | 18 | 116 | 6.1 |
| 66Zn | 0.232 | 51.6 | 58 | 55 | 57 | 59 | 58 | 57 | 111 | 2.5 |
| 75As | 0.420 | 6.87 | 6.7 | 6.4 | 7.0 | 7.0 | 7.0 | 6.8 | 99 | 4.0 |
| 77Se | 0.320 | 3.45 | 2.8 | 3.0 | 3.3 | 3.4 | 3.5 | 3.2 | 93 | 9.0 |
| 88Sr | 0.001 | 10.1 | 12 | 10 | 11 | 11 | 11 | 11 | 110 | 5.1 |
| 95Mo | 0.001 | 0.29 | 0.355 | 0.332 | 0.318 | 0.318 | 0.298 | 0.324 | 112 | 6.5 |
| 107Ag | 0.001 | 0.0252 | 0.030 | 0.025 | 0.029 | 0.029 | 0.029 | 0.028 | 113 | 6.7 |
| 111Cd | 0.043 | 0.299 | 0.342 | 0.354 | 0.342 | 0.354 | 0.319 | 0.342 | 114 | 4.2 |
| 118Sn | 0.011 | 0.061 | 0.088 | 0.074 | 0.081 | 0.075 | 0.076 | 0.079 | 129 | 7.3 |
| 121Sb | 0.001 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 0.011 | 100 | 0.0 |
| 137Ba | 0.001 | 8.6 | 8.7 | 8.6 | 8.7 | 8.1 | 8.7 | 8.6 | 100 | 3.1 |
| 202Hg | 0.033 | 0.412 | 0.470 | 0.408 | 0.431 | 0.474 | 0.499 | 0.456 | 111 | 8.0 |
| 205Tl | - | - | - | - | - | - | - | - | - | - |
| 208Pb | 0.001 | 0.404 | 0.488 | 0.591 | 0.616 | 0.494 | 0.503 | 0.539 | 133 | 11.0 |
| 238U | 0.001 | 0.05 | 0.062 | 0.060 | 0.067 | 0.066 | 0.066 | 0.064 | 129 | 4.8 |

Notes:

ppm = parts per million

% = percent

RSD = Relative Standard Deviation

Data Quality Objectives:

Accuracy: DQO of 60 - 140% of the certified values for B, Ti, Ag, Sn, Sb, and Ba.

Accuracy: DQO of 90 - 110% of the certified values for Se.

Accuracy: DQO of 70 - 130% of the certified values for all other elements provided.

Precision: DQO of $\leq 20\%$ was established for all elements.

DORM-4 used for all elements except B, Ti, Sb, Ba, and Al where NIST-1566b was used.

Bold indicates DQO exceedance, but result is accepted as it does not impact the reportable results.



TESTING LOCATION (Please Circle)

Burnaby
 2664 Commerce Court
 Burnaby, British Columbia, Canada
 V5A 4N7
 Phone 604.420.8773

Chain of Custody

May 19 2020 Page 2 of 6

| Report to: | | Invoice To: | | ANALYSES REQUIRED | | Receipt Temperature (°C) | |
|--|---|--|--------------|--|--|--|---|
| Company | Address | Company | Address | | | | |
| Nautilus Environmental (Burnaby) | | Nautilus Environmental (Burnaby) | | | | | |
| Address | | Address | | | | | |
| City/State/Zip | | City/State/Zip | | | | | |
| Contact | | Contact | | | | | |
| Phone | | Phone | | | | | |
| Email | james@nautilusenvironmental.ca bonnie@nautilusenvironmental.ca | Email | james/bonnie | | | | |
| PO No. | | PO No. | | | | | |
| Sample Collection By: | | Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite | | Total Selenium dw | | 38 | |
| SAMPLE ID | DATE | TIME | MATRIX | # OF CONTAINERS AND VOLUME (e.g. 1 x 20 L) | COMMENTS | | |
| 1 - STPD-11 | N/A | N/A | eggs | | Trach ID #1 011 | | |
| 2 - STPD-12 | N/A | N/A | eggs | | 012 | | |
| 3 - STPD-13 | N/A | N/A | eggs | | 013 | | |
| 4 - STPD-14 | N/A | N/A | eggs | | 014 | | |
| 5 - STPD-15 | N/A | N/A | eggs | | 015 | | |
| 6 - STPD-16 | N/A | N/A | eggs | | 016 | | |
| 7 - ERIMF-4 | N/A | N/A | eggs | | 017 | | |
| 8 - ERIMF-5 | N/A | N/A | eggs | | 018 | | |
| 9 - ERIMF-6 | N/A | N/A | eggs | | 019 | | |
| 10 - ERIMF-7 | N/A | N/A | eggs | | 020 | | |
| SPECIAL INSTRUCTIONS/COMMENTS (CLIENT) | | | | SAMPLE RECEIPT DETAILS (LABORATORY) | | SAMPLE DESCRIPTION AND COMMENTS (LABORATORY) (Project # 2020-113) | |
| | | | | 1. Total No. of Containers | 60 | | 4. Ice Present in Cooler? <input checked="" type="radio"/> Y <input type="radio"/> N |
| | | | | 2. Courier | Fedex | | 5. Seal Present? <input checked="" type="radio"/> Y <input type="radio"/> N |
| | | | | 3. Good Condition? | <input checked="" type="radio"/> Y <input type="radio"/> N | | 6. Initials Present on Seal? <input checked="" type="radio"/> Y <input type="radio"/> N |
| RELINQUISHED BY (CLIENT) | | | | RECEIVED BY (LABORATORY) | | | |
| | | | | JESSIE LABINE Project Name TELERHANTON INC. Company 21-May-2020 Date and Time 13:30 Date and Time | | | |
| Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted. | | | | | | | |

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received. No liability in whole or in part is assumed for the collector, handling or transport of the sample, applications or interpretation of the test data or results in part or in whole.



TESTING LOCATION (Please Circle)

Burnaby
 8664 Commerce Court
 Burnaby, British Columbia, Canada
 V5A 4N7
 Phone 604-420-8773

Calgary
 44, 6125 12 Street SE
 Calgary, Alberta, Canada
 T2H 2K1
 Phone 403-253-7121

Chain of Custody

May 19 2020 Page 3 of 6

| Report to: | | Invoice To: | | ANALYSES REQUIRED | |
|---|------|---|--------|--|----------------|
| Nautilus Environmental (Burnaby) Address _____ City/State/Zip _____ Contact _____ Phone _____ Email james@nautilusenvironmental.ca boonie@nautilusenvironmental.ca | | Nautilus Environmental (Burnaby) Address _____ City/State/Zip _____ Contact _____ Phone _____ Email james@nautilusenvironmental.ca PO No. _____ | | | |
| Sample Collection By: | | Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite | | | |
| SAMPLE ID | DATE | TIME | MATRIX | # OF CONTAINERS AND VOLUME (e.g. 1 x 20 L) | COMMENTS |
| 1 ✓ ERIMF-8 | N/A | N/A | eggs | | Truck ID # 021 |
| 2 ✓ ERIMF-9 | N/A | N/A | eggs | | 033 |
| 3 ✓ ERIMF-10 | N/A | N/A | eggs | | 023 |
| 4 ✓ ERIMF-11 | N/A | N/A | eggs | | 024 |
| 5 ✓ ERIMF-12 | N/A | N/A | eggs | | 025 |
| 6 ✓ ERIMF-13 | N/A | N/A | eggs | | 026 |
| 7 ✓ ERIMF-14 | N/A | N/A | eggs | | 027 |
| 8 ✓ ERIMF-15 | N/A | N/A | eggs | | 028 |
| 9 ✓ ERIMF-16 | N/A | N/A | eggs | | 029 |
| 10 ✓ LNLK-11 | N/A | N/A | eggs | | 030 |
| Total Selenium dw | | | | | |
| Receipt Temperature (°C) 19.2 | | | | | |
| SPECIAL INSTRUCTIONS/COMMENTS (CLIENT) | | | | | |
| SPECIAL INSTRUCTIONS/COMMENTS (LABORATORY) | | | | | |
| 1. Total No. of Containers: 60 <input checked="" type="radio"/> Y <input type="radio"/> N 2. Cooler: FedEx <input checked="" type="radio"/> Y <input type="radio"/> N 3. Good Condition? <input checked="" type="radio"/> Y <input type="radio"/> N 4. Ice Present in Cooler? <input checked="" type="radio"/> Y <input type="radio"/> N 5. Seal Present? <input checked="" type="radio"/> Y <input type="radio"/> N 6. Initials Present on Seal? <input checked="" type="radio"/> Y <input type="radio"/> N | | | | | |
| RECEIVED BY (LABORATORY) | | | | | |
| RECEIVED BY (CLIENT) GEORGIE LABINE TOWNANALYSES INC 21 May 2020 13:30 Date and Time | | | | | |
| Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted. | | | | | |

(Project # 2020-113)

Our liability is limited to the cost of the test requested. The test results only relate to the sample as received; the liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.



TESTING LOCATION (Please Circle)

Burnaby
 1664 Commerce Court
 Burnaby, British Columbia, Canada
 V6A 4N7
 Phone: 604-430-8773

Calgary
 #4, 6125 12 Street SE
 Calgary, Alberta, Canada
 T2H 2K1
 Phone: 403-253-7121

Chain of Custody

May 19 2020, Page 4 of 6.

| Report to: | | Invoice To: | | ANALYSES REQUIRED | | Receipt Temperature (C) |
|--|---|---|-----|---|------------|-------------------------|
| Company: Nautilus Environmental (Burnaby) | Company: Nautilus Environmental (Burnaby) | Company: Nautilus Environmental (Burnaby) | | | | |
| Address: Nautilus Environmental (Burnaby) | Address: Nautilus Environmental (Burnaby) | Address: Nautilus Environmental (Burnaby) | | | | |
| City/State/Zip: Nautilus Environmental (Burnaby) | City/State/Zip: Nautilus Environmental (Burnaby) | City/State/Zip: Nautilus Environmental (Burnaby) | | | | |
| Contact: Nautilus Environmental (Burnaby) | Contact: Nautilus Environmental (Burnaby) | Contact: Nautilus Environmental (Burnaby) | | | | |
| Phone: Nautilus Environmental (Burnaby) | Phone: Nautilus Environmental (Burnaby) | Phone: Nautilus Environmental (Burnaby) | | | | |
| Email: james@nautilusenvironmental.ca | Email: james@nautilusenvironmental.ca | Email: james@nautilusenvironmental.ca | | | | |
| Sample Collection By: bonnie@nautilusenvironmental.ca | Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite <input type="checkbox"/> | PO No.: | | | | |
| SPECIAL INSTRUCTIONS/COMMENTS (CLIENT) | | SPECIAL RECEIPT DETAILS (LABORATORY) | | SAMPLE DESCRIPTION AND COMMENTS (LABORATORY) | | |
| 1 | LNK-12 | N/A | N/A | eggs | Trick ID # | 8°C |
| 2 | LNK-13 | N/A | N/A | eggs | 031 | |
| 3 | LNK-14 | N/A | N/A | eggs | 032 | |
| 4 | LNK-15 | N/A | N/A | eggs | 033 | |
| 5 | LNK-16 | N/A | N/A | eggs | 034 | |
| 6 | LNK-17 | N/A | N/A | eggs | 035 | |
| 7 | LNK-18 | N/A | N/A | eggs | 036 | |
| 8 | LNK-19 | N/A | N/A | eggs | 037 | |
| 9 | LNK-20 | N/A | N/A | eggs | 038 | |
| 10 | ERWSF-1 | N/A | N/A | eggs | 039 | |
| | | 1. Total No. of Containers: 60 | | 4. Ice Present in Cooler? <input checked="" type="radio"/> Y <input type="radio"/> N | | |
| | | 2. Cooler: FedEx | | 5. Seal Present? <input checked="" type="radio"/> Y <input type="radio"/> N | | |
| | | 3. Good Condition? <input checked="" type="radio"/> Y <input type="radio"/> N | | 6. Initials Present on Seal? <input checked="" type="radio"/> Y <input type="radio"/> N | | |
| RELINQUISHED BY (CLIENT) | | RECEIVED BY (LABORATORY) | | | | |
| Genevieve Labine | | Genevieve Labine | | | | |
| Trich Analytics Inc. | | Trich Analytics Inc. | | | | |
| 21 May 2020 | | 13:30 | | | | |
| Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted. | | | | | | |

(Project # 2020-113)

Our facility is bonded to the cost of the test requested. This fee results only when the sample is received. No liability in whole or in part is assumed by the collector, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.



TESTING LOCATION (Please Circle)

Burnaby
8644 Commerce Court
Burnaby, British Columbia, Canada
V5A 4N7
Phone: 604.420.8773

Calgary
#4, 6125 12 Street SE
Calgary, Alberta, Canada
T2H 2K1
Phone: 403.253.7121

Chain of Custody

May 19 2020 Page 3 of 6

| | | | |
|---|--|--|--|
| Report to: Company: Nautilus Environmental (Burnaby) Address: _____ City/State/Zip: _____ Contact: _____ Phone: _____ Email: james@nautilusenvironmental.ca bonnie@nautilusenvironmental.ca | | Invoice To: Company: Nautilus Environmental (Burnaby) Address: _____ City/State/Zip: _____ Contact: _____ Phone: _____ Email: james/bonnie PO No.: _____ | |
| Sample Collection By: _____ Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite | | | |

| SAMPLE ID | DATE | TIME | MATRIX | # OF CONTAINERS AND VOLUME (e.g. 1 x 20 L) | COMMENTS |
|-------------|------|------|--------|--|--------------|
| ✓ ERWSF-2 | N/A | N/A | eggs | 0.41 | Truck ID # 1 |
| ✓ ERWSF-3 | N/A | N/A | eggs | 0.42 | |
| ✓ ER-01 | N/A | N/A | eggs | 0.43 | |
| ✓ ER-02 | N/A | N/A | eggs | 0.44 | |
| ✓ ER-03 | N/A | N/A | eggs | 0.45 | |
| ✓ ER-04 | N/A | N/A | eggs | 0.46 | |
| ✓ ER-05 | N/A | N/A | eggs | 0.47 | |
| ✓ ER-05-Dup | N/A | N/A | eggs | 0.48 | |
| ✓ ER-06 | N/A | N/A | eggs | 0.49 | |
| ✓ ER-07 | N/A | N/A | eggs | 0.50 | |

| SPECIAL INSTRUCTIONS/COMMENTS (CLIENT) | SAMPLE RECEIPT DETAILS (LABORATORY) | SAMPLE DESCRIPTION AND COMMENTS (LABORATORY) |
|---|--|--|
| | 1. Total No. of Containers: 60 2. Courier: FedEx 3. Good Condition?: <input checked="" type="radio"/> Y <input type="radio"/> N 4. Ice Present in Cooler?: <input checked="" type="radio"/> Y <input type="radio"/> N 5. Seal Present?: <input checked="" type="radio"/> Y <input type="radio"/> N 6. Initials Present on Seal?: <input checked="" type="radio"/> Y <input type="radio"/> N | (Project # 2020-113) |
| RELINQUISHED BY (CLIENT) | RECEIVED BY (LABORATORY) | |
| James Bonnie Nautilus Environmental 21 May 2020 13:30 | Genevieve Labrie TrueAnalytics Inc 21 May 2020 13:30 | |

Receipt Temperature (C) 8°C

Total Selenium dw

ANALYSES REQUIRED

Our liability is limited to the cost of the test requested. This test results only relate to the sample as received. No liability in whole or in part is assumed for the collection, handling, or transport of the sample, application or interpretation of the test data or results in part or in whole.

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.



TESTING LOCATION (Please Circle)

Burnaby 8664 Commerce Court Burnaby, British Columbia, Canada V5A 4N7 Phone: 604-420-8773

Chain of Custody

| Report to: | Invoice To: | Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite <input type="radio"/> | | | |
|---|--|--|--|--|---|
| Company: Nautilus Environmental (Burnaby) Address: _____ City/State/Zip: _____ Contact: _____ Phone: _____ Email: jamesa@nautilusenvironmental.ca, bonnie@nautilusenvironmental.ca | Company: Nautilus Environmental (Burnaby) Address: _____ City/State/Zip: _____ Contact: _____ Phone: _____ Email: James/Bonnie PO No.: _____ | Sample Type: <input type="radio"/> Grab <input type="radio"/> OR <input type="radio"/> Composite <input type="radio"/> | | | |
| SAMPLE ID | DATE | TIME | MATRIX | # OF CONTAINERS AND VOLUME (e.g. 1 x 20 L) | COMMENTS |
| 1 ✓ ER-07-Dup | N/A | N/A | eggs | | Trough 10 #2 |
| 2 ✓ ER-08 | N/A | N/A | eggs | | 0.51 |
| 3 ✓ ER-08-Dup | N/A | N/A | eggs | | 0.52 |
| 4 ✓ ER-09 | N/A | N/A | eggs | | 0.53 |
| 5 ✓ ER-10 | N/A | N/A | eggs | | 0.54 |
| 6 ✓ ER-11 | N/A | N/A | eggs | | 0.55 |
| 7 ✓ ER-12 | N/A | N/A | eggs | | 0.56 |
| 8 ✓ ER-13 | N/A | N/A | eggs | | 0.57 |
| 9 ✓ ER-14 Dup 1 | N/A | N/A | eggs | | 0.58 |
| 10 ✓ ER-14 Dup 2 | N/A | N/A | eggs | | 0.59 |
| | | | | | 0.60 |
| SPECIAL INSTRUCTIONS/COMMENTS (CLIENT) | | | SAMPLE RECEIPT DETAILS (LABORATORY) | | |
| | | | 1. Total No. of Containers | 60 | 4. Ice Present in Cooler? <input checked="" type="radio"/> Y <input type="radio"/> N |
| | | | 2. Courier | 60tex | 5. Seal Present? <input checked="" type="radio"/> Y <input type="radio"/> N |
| | | | 3. Good Condition? | <input checked="" type="radio"/> Y <input type="radio"/> N | 6. Inhibits Present on Seal? <input checked="" type="radio"/> Y <input type="radio"/> N |
| RELINQUISHED BY (CLIENT) | | | RECEIVED BY (LABORATORY) | | |
| Signature: Printed Name: Genevieve LaBine | | | Signature: Printed Name: Genevieve LaBine | | |
| Date: 21 May 2020 Time: 13:30 | | | Date: 21 May 2020 Time: 13:30 | | |
| Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted. | | | | | |

Project # 2020-113

Our liability is limited to the cost of the test requested. We are not responsible for the collection, handling, or transport of the sample application or interpretation of the test data or results in part or in whole.

APPENDIX F

Laboratory Toxicity Report



Evaluation of the reproductive effects of selenium on reidside shiner (*Richardsonius balteatus*)

Final Report (revised)

December 7, 2020

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

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APPENDIX A – Redside shiner (*Richardsonius balteatus*) exposure data

SIGNATURE PAGE



Report By:
Bonnie Lo, MET
Environmental Toxicologist



Reviewed By:
James Elphick, R.P.Bio
Environmental Toxicologist

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

1.0 INTRODUCTION

In collaboration with Minnow Environmental Inc. and Golder Associates Ltd., Nautilus Environmental Company Inc. conducted a laboratory exposure using field collected reidside shiners (RSC, *Richardsonius balteatus*) to characterize effects of maternally-transferred selenium on early life stage development of RSC. Eggs were fertilized in the field and transported to the Nautilus Environmental laboratory (Burnaby, BC) for rearing. Viable eggs were reared until completion of yolk sac absorption and assessed for mortality, length, weight and deformities.

This report summarizes the methods and results from the laboratory exposures. Additional details associated with field collection efforts and interpretation of the data have been reported separately.

2.0 METHODS

2.1 Fertilization

Nautilus Environmental scientists were deployed into the field once field crews observed spawning behavior and morphological features suggesting ripe fish were present. Fish were anaesthetized using clove oil and eggs and milt were expressed by application of gentle pressure to the abdomen.

Milt was collected from males using a glass pipette and pooled from a minimum of two males for each fertilization event in a small plastic container that was kept cold. Eggs were expressed onto a glass microscope slide and transferred to a Petri dish. A combination of wet and dry fertilization was used. A small volume of pooled milt (approximately 1 or 2 drops) was added to each batch of eggs and the eggs gently mixed. After a short period of dry fertilization (i.e., in the absence of water), a sufficient volume of reconstituted moderately hard water (USEPA, 1985) was added to cover the eggs and the eggs were allowed to fertilize under wet conditions for several minutes. Eggs were then transferred to a plastic container with approximately 1 L of laboratory water. Additional details regarding method development for fertilization are provided in Section 3.1.

Fertilized eggs were transported by a Nautilus Environmental scientist via vehicle and air; the containers were filled with no headspace and sealed and packaged with bubble wrap and ice packs in coolers. Care was taken to minimize mechanical disturbance and temperature fluctuations, and the eggs were inspected at airport security so that X-ray would not be required.

If eggs were being held overnight prior to transport, efforts were made to maintain holding temperature at 11 - 14°C, consistent with the range measured at the collection sites. Transportation of eggs occurred between one hour and two days post fertilization.

2.2 Tissue collection

Following expression of eggs and just prior to fertilization, a sample of ripe eggs was collected for selenium analysis. Egg samples were frozen and stored at -20 °C following arrival at the laboratory. Additional subsamples were collected from the adult females by Minnow Environmental.

2.3 Test methods

Rearing conditions are summarized in Table 1. Upon arrival at the laboratory, temperature was recorded and the containers were placed in an environmental control testing chamber held at 14 ± 2°C. To minimize stress following transport and allow equilibration to laboratory conditions, eggs were not transferred to rearing containers until at least 12 hours after arrival. Eggs were provided continuous aeration throughout rearing. Water renewals (approximately 80%) occurred daily and water quality parameters (temperature, dissolved oxygen, pH) were measured before and after water renewal. Conductivity of water was measured daily.

When eggs from a female were observed using a dissection microscope to have reached the gastrula stage, which generally occurred three or four days following arrival at the laboratory, an assessment of fertilized eggs was conducted; eggs were assumed to be unfertilized if the egg did not form a gastrula. Fertilized eggs were counted and divided into replicate containers, targeting four replicates, each with 50 fertilized eggs. Due to the varying number of collected and fertilized eggs, the number of replicates and eggs per replicate varied across females.

Eggs were monitored daily for mortality and hatch. When observed, hatched fish were transferred to a 2-L rearing container that corresponded to the same replicate. Except for volume, rearing conditions remained the same. Observations regarding hatch and mortality were recorded daily. When yolk sac absorption was complete (20 to 21 days post fertilization), the fish were euthanized using tricaine mesylate (CAS 886-86-2). All fish were assessed for deformities using a Graduated Severity Index (GSI) (Table 2) as described and used by Holm et al. (2003) and Rudolph et al. (2008). Twenty fish from each replicate were randomly selected and measured for individual fish length; when the number of fish per replicate was less than twenty, length of all fish was measured. Following length and deformity assessments, fish were pooled and dried at 60°C for a minimum of 24 hours after which dry weight was measured.

Table 1. Rearing conditions for redbside shiners.

| | |
|--------------------------|--|
| Test type | Static renewal, daily |
| Test duration | Until yolk sac absorption (20 to 21 days post fertilization) |
| Rearing water | Reconstituted moderately hard water |
| Test organism allocation | Variable due to different number of viable fertilized eggs; targeted 50 eggs per replicate |
| Test vessel, test volume | 1L containers (eggs) and 2L containers (hatched fish) |
| Aeration | Continuous gentle aeration |
| Temperature | 14 ± 2 °C |
| Lighting | 16 h light: 8 h dark photoperiod; 100-500 lux |
| Endpoints | Survival, length, weight, deformities |

Table 2. Graduated Severity Index (GSI) for evaluating larval fish deformities.

| GSI | Category | | | |
|-----|--|---|---|--|
| | Skeletal | Craniofacial | Finfold | Edema |
| 0 | Normal backbone. (≤15°) | Normal jaw, face and head. | All fins present and normal. | No fluid accumulation in head or pericardial cavity. |
| 1 | Slight (15-44°) lordosis, scoliosis or kyphosis. Unlikely to impair fish movement. | Slightly reduced (<20%) or malformed eye or jaw. Unlikely to impair feeding ability or sight. | One or two fins slightly (<50%) reduced in size or slightly malformed. Unlikely to impair fish movement. | Slight (<20% of volume of normal) fluid accumulation, but unlikely to impair sight, movement or feeding. |
| 2 | Moderate (45-89°) lordosis, scoliosis or kyphosis. Likely to impair fish movement. | Moderately (20-49%) reduced or malformed eye or jaw. Likely to impair feeding ability or sight. | More than two fins slightly reduced in size or slightly malformed, or 1 or 2 moderately (≥50%) deformed fins. Likely to impair fish movement. | Moderate (20-49% of normal volume) fluid accumulation. Likely to impair sight, movement or feeding. |
| 3 | Severe (≥90°) lordosis, scoliosis or kyphosis. Fish movement likely to cease or be greatly impaired. | Severely (≥50% or missing) reduced or malformed eye or jaw. Feeding ability or sight severely impaired. | One or more missing fins, or two or more moderately (≥50%) deformed. Swimming ability severely impaired. | Severe (≥50% of normal volume) fluid accumulation. Greatly reduced sight, movement or feeding. |

2.4 QA/QC

Several laboratory QA/QC measures were implemented to ensure the data produced were reliable. Actions included:

Husbandry

- Laboratory water was measured for chlorine (weekly) and total metals (by ICP scan) approximately monthly to confirm water was of suitable quality. Water quality in rearing containers was monitored daily for temperature, dissolved oxygen, conductivity and pH.
- Appropriate test conditions were maintained (e.g., room temperature, water temperature, lighting, aeration). Daily monitoring was documented; deviations were documented and their implications on data quality considered.
- Laboratory staff had prior experience with rearing early life stage fish.
- Standard laboratory and good house-keeping practices were utilized on laboratory instrumentation and materials to reduce the risk of cross-contamination between batches of eggs and exposure containers.

Deformity assessments

- Deformity analyses were conducted by technicians with training and experience in fish deformity analyses.
- The test containers were labelled in a manner to prevent the technician from knowing the identity of any fish.
- An *a priori* framework was used for the GSI scoring system (Table 2).
- Photographs were taken from a representative selection of fish (deformed and normal) and used as a guide for the GSI framework.
- A minimum of 10% of the larval fish were examined by a secondary observer not involved in the original scoring.

3.0 RESULTS

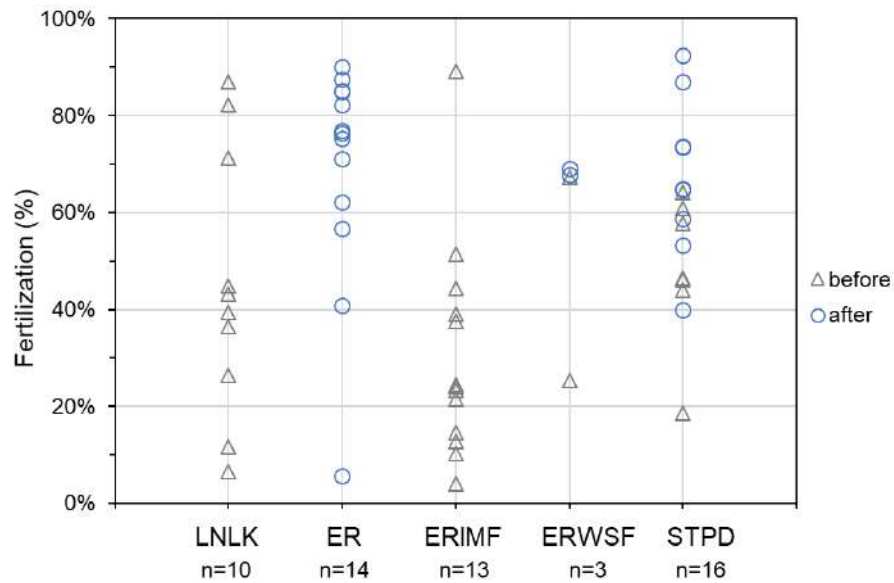
3.1 Fertilization

Manual expression and fertilization of RSC gametes had not been conducted prior to this study and modifications to methods used for fertilization events were necessary between fertilization attempts. The first attempt to express eggs (10 females from Loon Lake and 3 from ERIMF) did not result in viable eggs. Pressure was applied to the abdomen of females and eggs were expressed; however, observations made in the days following fertilization indicated that the eggs were not developing (eggs were white, perivitelline space not visible). Moderate pressure had been required to express these eggs and some of the expressed eggs were clumped together and were of a range of sizes. These results suggested the eggs were not sufficiently ripe. The Gonadal Somatic Index for the females collected during the first fertilization event ranged from 9 to 20%.

During the second fertilization event, females that did not express eggs with light pressure to the abdomen were considered to be not sufficiently ripe. Eggs that were readily expressed with light pressure were uniform in size and well coated in ovarian fluid. The perivitelline space (space between the plasma membrane and chorion) was observed when assessed 15 minutes following fertilization. The Gonadal Somatic Index of ripe females used in the study ranged from 5 to 26%.

Fertilization rates were variable, ranging from 4 to 92% with a mean of 52% (Table 3). After the first four successful fertilization events, the mean fertilization rate was 40%, suggesting that efforts to optimize fertilization methods were warranted. During the initial four rounds of fertilization, the duration of the dry fertilization period was between 5 to 10 minutes while the wet fertilization period was between 10 to 15 minutes. It was hypothesized that higher fertilization rates might be observed if a shorter dry fertilization period was used, since the small size of the eggs made them potentially subject to drying during the dry fertilization period. To test this hypothesis, eggs from one newly expressed female were separated into two groups; one group was dry fertilized for approximately two minutes and the second group for approximately 15 minutes. The short dry fertilization period resulted in a fertilization rate of 68% while the longer period saw a significantly lower rate of 25%. Following this trial, fertilization methods were revised to include a short dry fertilization period of 2 minutes. The mean fertilization rate of eggs increased to 69% following implementation of this method development (Figure 1). The majority of the fish that were fertilized with the longer dry fertilization period were from the Loon Lake (LNLK) reference area and ERIMF.

Figure 1. Fertilization rates before and after method optimization.



3.2 Rearing

Water quality remained acceptable throughout rearing. Eggs were successfully transported to the laboratory by a combination of vehicle and plane. Upon arrival, there was no evidence of damaged eggs or mortalities. There was no evidence of fungal growth during rearing and, therefore, prophylactic treatment of eggs with an anti-fungal treatment was not required.

Larval RSC were terminated once yolk sac absorption was complete. This occurred 20 to 21 days post fertilization and was consistent across females and collection sites. Feeding behaviour was not observed during rearing; a small number of extra fish from the first successful fertilization event were reared in the presence of food and used to assess whether feeding of hatched fish was necessary. Once these additional fish were active, they were provided newly hatched *Artemia* nauplii; however, these fish showed no signs of feeding (chasing or consumption of *Artemia*) prior to complete yolk sac absorption.

Mean (and standard deviation) survival from fertilized egg to termination of the fish following yolk sac absorption of RSC originating from the Loon Lake (LNLK) reference site was $84.3 \pm 23.9\%$. Survival ranged from 81 to 100% for eggs from nine of the ten females; eggs from the remaining female exhibited low survival (18%) (Table 3). This female also exhibited a low rate of fertilization (12%) which yielded only 38 fertilized eggs. Other females also exhibited low fertilization rate but produced a high rate of survival; therefore, the reason for low survival in eggs from this one fish

are not known. The overall high survival of the fish originating from the Loon Lake imply that it would be reasonable to use the Loon Lake reference site to compare performance observed in RSC originating from exposure sites. The results also suggest that the rearing methods used in this study were suitable for successful rearing of early life stage RSC.

3.3 Survival, growth and deformity assessments

Survival was generally high across sites with a mean and standard deviation of $84.6 \pm 17.3\%$. In addition to the one Loon Lake female discussed above, eggs from one fish originating from Kooconusa Reservoir (ER) also exhibited low survival (23%) (Table 3). Due to personnel constraints, this female had been held overnight in a minnow trap before being manually expressed. The eggs were observed as sticky and clumped following fertilization, notably different from the other batches of ripe eggs, and had a low rate of fertilization (6%). None of the other females were held overnight prior to gamete collection.

Growth (dry weight and length) was consistent across sites. Mean (and standard deviation) dry weight was 0.35 ± 0.05 mg and ranged from 0.22 to 0.46 mg. Fish length was 7.2 ± 0.4 mm and ranged from 6.5 to 7.9 mm.

Similar to the other endpoints, there did not appear to be a relationship between incidence of deformities and collection site. When considering fish with any deformity (GSI scores of 1 or more), the mean (\pm standard deviation) incidence of deformity was $10.4 \pm 18.4\%$ and ranged between 0 and 100%. The female that yielded an incidence of deformity of 100% was the Loon Lake female that also produced low survival and fertilization. Of the 38 fertilized eggs reared, only seven survived until termination, all of which exhibited a mild deformity. For fish with significant or multiple deformities (GSI of 2 or more), the mean (\pm standard deviation) percent of deformed fish was $7.0 \pm 11.2\%$ and ranged between 0 and 47.3%.

Table 3. Redside shiner survival, growth and incidence of deformities

| Site | Female ID | Survival mean \pm SD (%) | Fertilization (%) | Length mean \pm SD (mm) | Dry weight per fish mean \pm SD (mg) | Incidence of deformity (GSI 1 or more) mean \pm SD (%) | Incidence of deformity (GSI 2 or more) mean \pm SD (%) |
|-------|-----------|----------------------------|-------------------|---------------------------|--|--|--|
| STPD | 1 | 79 \pm 10 | 61 | 7.8 \pm 0.3 | 0.34 \pm 0.01 | 2.8 \pm 3.3 | 2.0 \pm 2.5 |
| STPD | 2 | 96 \pm 4.9 | 64 | 7.3 \pm 0.2 | 0.35 \pm 0.01 | 1.1 \pm 1.2 | 1.1 \pm 1.2 |
| STPD | 3 | 76 \pm N/A | 19 | 7.6 \pm N/A | 0.31 \pm N/A | 0 \pm N/A | 0 \pm N/A |
| STPD | 4 | 88 \pm 6.8 | 47 | 7.1 \pm 0.1 | 0.28 \pm 0.00 | 1.7 \pm 2.9 | 0 \pm 0.0 |
| STPD | 5 | 92 \pm 2.0 | 46 | 7.1 \pm 0.3 | 0.3 \pm 0.01 | 1.5 \pm 1.3 | 1.5 \pm 1.3 |
| STPD | 6 | 90 \pm 5.5 | 44 | 7.2 \pm 0.4 | 0.35 \pm 0.00 | 4.7 \pm 6.6 | 4.7 \pm 6.6 |
| STPD | 7 | 90 \pm 14 | 58 | 6.8 \pm 0.0 | 0.26 \pm 0.04 | 9.6 \pm 6.6 | 9.6 \pm 6.6 |
| STPD | 8 | 84 \pm 3.1 | 65 | 6.8 \pm 0.2 | 0.28 \pm 0.01 | 4.4 \pm 1.8 | 4.4 \pm 1.8 |
| STPD | 9 | 89 \pm 17 | 74 | 7.2 \pm 0.2 | 0.34 \pm 0.01 | 5.6 \pm 0.6 | 4.7 \pm 1.7 |
| STPD | 10 | 82 \pm 8.7 | 59 | 7.3 \pm 0.2 | 0.4 \pm 0.00 | 7.7 \pm 1.9 | 6.9 \pm 1.4 |
| STPD | 11 | 94 \pm 5.9 | 87 | 7.1 \pm 0.1 | 0.29 \pm 0.01 | 1.6 \pm 2.2 | 1.1 \pm 1.2 |
| STPD | 12 | 88 \pm 2.2 | 53 | 7.1 \pm 0.2 | 0.29 \pm 0.01 | 3.6 \pm 2.0 | 3.6 \pm 2.0 |
| STPD | 13 | 46 \pm 37 | 40 | 7.3 \pm 0.1 | 0.31 \pm 0.01 | 4.2 \pm 5.9 | 2.8 \pm 3.9 |
| STPD | 14 | 91 \pm 7.2 | 74 | 7.3 \pm 0.2 | 0.36 \pm 0.01 | 16 \pm 19.3 | 11 \pm 12.3 |
| STPD | 15 | 90 \pm 5.9 | 65 | 7.3 \pm 0.1 | 0.34 \pm 0.01 | 2.7 \pm 0.5 | 2.7 \pm 0.5 |
| STPD | 16 | 90 \pm 8.4 | 93 | 6.9 \pm 0.1 | 0.28 \pm 0.00 | 23 \pm 19.7 | 5.5 \pm 4.0 |
| ERIMF | 4 | 87 \pm 0.94 | 44 | 7.0 \pm 0.2 | 0.24 \pm 0.01 | 0 \pm 0.0 | 0 \pm 0.0 |
| ERIMF | 5 | 98 \pm 5.0 | 89 | 7.4 \pm 0.2 | 0.35 \pm 0.01 | 1.1 \pm 2.2 | 1.1 \pm 2.2 |
| ERIMF | 6 | 88 \pm N/A | 13 | 6.7 \pm N/A | 0.32 \pm N/A | 14 \pm N/A | 14 \pm N/A |
| ERIMF | 7 | 70 \pm 2.3 | 22 | 7.2 \pm 0.0 | 0.37 \pm 0.02 | 21 \pm 9.5 | 16 \pm 3.0 |
| ERIMF | 8 | 83 \pm N/A | 10 | 7.4 \pm N/A | 0.4 \pm N/A | 0 \pm N/A | 0 \pm N/A |
| ERIMF | 9 | 100 \pm N/A | 4 | 7.5 \pm N/A | 0.42 \pm N/A | 0 \pm N/A | 0 \pm N/A |
| ERIMF | 10 | 95 \pm 3.7 | 52 | 7.4 \pm 0.2 | 0.34 \pm 0.00 | 6.8 \pm 6.5 | 5.4 \pm 4.5 |

| Site | Female ID | Survival | Fertilization (%) | Length | Dry weight per fish | Incidence of deformity (GSI 1 or more) | Incidence of deformity (GSI 2 or more) |
|-------|-----------|---------------|-------------------|----------------|---------------------|--|--|
| | | mean ± SD (%) | | mean ± SD (mm) | mean ± SD (mg) | mean ± SD (%) | mean ± SD (%) |
| ERIMF | 11 | 64 ± N/A | 23 | 6.7 ± N/A | 0.35 ± N/A | 32 ± N/A | 24 ± N/A |
| ERIMF | 12 | 42 ± 12 | 39 | 6.5 ± 0.2 | 0.33 ± 0.05 | 51 ± 21.7 | 47 ± 27.3 |
| ERIMF | 13 | 78 ± N/A | 15 | 6.7 ± N/A | 0.39 ± N/A | 44 ± N/A | 44 ± N/A |
| ERIMF | 14 | 59 ± 27 | 38 | 7.0 ± 0.4 | 0.45 ± 0.26 | 7.1 ± 10.1 | 2.4 ± 3.4 |
| ERIMF | 15 | 94 ± 5.7 | 24 | 7.1 ± 0.5 | 0.30 ± 0.01 | 20 ± 19.2 | 13 ± 12.8 |
| ERIMF | 16 | 79 ± N/A | 24 | 6.6 ± N/A | 0.30 ± N/A | 50 ± N/A | 39 ± N/A |
| LNLK | 11 | 95 ± 4.2 | 87 | 7.5 ± 0.1 | 0.40 ± 0.01 | 8.3 ± 15.3 | 4.4 ± 7.5 |
| LNLK | 12 | 91 ± 13 | 71 | 7.3 ± 0.2 | 0.41 ± 0.00 | 3.7 ± 5.2 | 1.2 ± 1.7 |
| LNLK | 13 | 81 ± 13 | 82 | 7.4 ± 0.0 | 0.38 ± 0.03 | 0.68 ± 1.4 | 0.68 ± 1.4 |
| LNLK | 14 | 93 ± 6.0 | 36 | 7.5 ± 0.2 | 0.36 ± 0.02 | 1.7 ± 3.3 | 0.56 ± 1.1 |
| LNLK | 15 | 85 ± 9.3 | 43 | 7.3 ± 0.2 | 0.35 ± 0.04 | 1.7 ± 3.5 | 0.58 ± 1.2 |
| LNLK | 16 | 18 ± N/A | 12 | 6.6 ± N/A | 0.41 ± N/A | 100 ± N/A | 43 ± N/A |
| LNLK | 17 | 94 ± 3.4 | 39 | 7.5 ± 0.1 | 0.35 ± 0.01 | 0.0 ± 0.0 | 0.0 ± 0.0 |
| LNLK | 18 | 100 ± N/A | 6.5 | 6.9 ± N/A | 0.37 ± N/A | 9.1 ± N/A | 9.1 ± N/A |
| LNLK | 19 | 87 ± 10.0 | 45 | 7.3 ± 0.1 | 0.41 ± 0.04 | 0.0 ± 0.0 | 0.0 ± 0.0 |
| LNLK | 20 | 99 ± 1.4 | 26 | 7.3 ± 0.0 | 0.38 ± 0.00 | 0.0 ± 0.0 | 0.0 ± 0.0 |
| ERWSF | 1 | 69 ± 7.1 | 67 | 7.5 ± 0.1 | 0.36 ± 0.01 | 5.7 ± 4.2 | 0.0 ± 0.0 |
| ERWSF | 2 | 85 ± 17 | 68* | 6.5 ± 0.1 | 0.22 ± 0.00 | 20 ± 6.3 | 18 ± 6.2 |
| ERWSF | 3 | 94 ± 5.2 | 69 | 6.8 ± 0.1 | 0.22 ± 0.01 | 2.0 ± 1.9 | 2.0 ± 1.9 |
| ER | 1 | 95 ± 3.0 | 41 | 7.4 ± 0.1 | 0.40 ± 0.03 | 4.9 ± 1.6 | 2.3 ± 1.7 |
| ER | 2 | 94 ± 7.9 | 71 | 7.5 ± 0.3 | 0.44 ± 0.01 | 2.0 ± 2.8 | 1.5 ± 1.9 |
| ER | 3 | 23 ± N/A | 5.7 | 7.0 ± N/A | 0.31 ± N/A | 60 ± N/A | 20 ± N/A |
| ER | 4 | 93 ± 4.5 | 90 | 7.5 ± 0.0 | 0.34 ± 0.01 | 0.69 ± 1.2 | 0.69 ± 1.2 |
| ER | 5 | 97 ± 3.0 | 76 | 7.5 ± 0.1 | 0.35 ± 0.00 | 2.0 ± 1.6 | 0.0 ± 0.0 |
| ER | 6 | 92 ± 7.1 | 62 | 7.4 ± 0.1 | 0.28 ± 0.02 | 1.6 ± 1.1 | 1.6 ± 1.1 |
| ER | 7 | 92 ± 3.4 | 76 | 7.6 ± 0.1 | 0.32 ± 0.02 | 2.2 ± 1.8 | 1.7 ± 1.1 |
| ER | 8 | 99 ± 1.9 | 77 | 7.9 ± 0.1 | 0.44 ± 0.01 | 1.5 ± 2.0 | 1.0 ± 1.2 |

| Site | Female ID | Survival mean \pm SD (%) | Fertilization (%) | Length mean \pm SD (mm) | Dry weight per fish mean \pm SD (mg) | Incidence of deformity (GSI 1 or more) mean \pm SD (%) | Incidence of deformity (GSI 2 or more) mean \pm SD (%) |
|------|-----------|----------------------------|-------------------|---------------------------|--|--|--|
| ER | 9 | 97 \pm 4.1 | 85 | 7.9 \pm 0.1 | 0.36 \pm 0.01 | 0.99 \pm 1.1 | 0.45 \pm 0.9 |
| ER | 10 | 90 \pm 5.1 | 57 | 7.5 \pm 0.2 | 0.36 \pm 0.01 | 6.9 \pm 2.9 | 5.8 \pm 2.2 |
| ER | 11 | 96 \pm 3.4 | 87 | 7.5 \pm 0.0 | 0.32 \pm 0.01 | 2.1 \pm 1.7 | 2.1 \pm 1.7 |
| ER | 12 | 97 \pm 4.7 | 82 | 7.7 \pm 0.1 | 0.32 \pm 0.01 | 2.7 \pm 3.3 | 1.6 \pm 2.1 |
| ER | 13 | 95 \pm 6.2 | 85 | 7.9 \pm 0.0 | 0.36 \pm 0.04 | 1.6 \pm 1.1 | 1.0 \pm 1.2 |
| ER | 14 | 93 \pm 6.2 | 75 | 7.8 \pm 0.2 | 0.46 \pm 0.02 | 3.8 \pm 1.0 | 3.8 \pm 1.0 |

*Higher fertilization rate from fertilization method development

Overall, the high survival, consistent growth and generally low incidence of deformities suggest that limited differences between RSC collection sites and that the methods developed during this study were suitable for successful rearing of this species.

4.0 REFERENCES

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APPENDIX A – Redside shiner (*Richardsonius balteatus*) exposure data

| Site | Female ID | trich-Se unripe ovary | SRC-Se unripe ovary | n (# of reps) | % Fertilization | Average length | | Deformity GSI 1 or more | | Deformity GSI 2 or more | | avg dry weight per fish | | Survival | |
|-------|-----------|-----------------------|---------------------|---------------|-----------------|----------------|----------------|-------------------------|--------|-------------------------|--------|-------------------------|--------|----------|-----------------|
| | | | | | | mean (mm) | Length SD (mm) | mean (%) | SD (%) | mean (%) | SD (%) | mean (mg) | SD | (%) | Survival SD (%) |
| STPD | 1 | 36.8 | 35 | 4 | 61 | 7.8 | 0.29 | 2.8 | 3.3 | 2.0 | 2.5 | 0.34 | 0.015 | 79 | 10 |
| STPD | 2 | 35.0 | 35 | 4 | 64 | 7.3 | 0.18 | 1.1 | 1.2 | 1.1 | 1.2 | 0.35 | 0.0051 | 96 | 4.9 |
| STPD | 3 | 25.9 | 31 | 1 | 19 | 7.6 | | 0 | | 0 | | 0.31 | | 76 | |
| STPD | 4 | 35.7 | 39 | 3 | 47 | 7.1 | 0.14 | 1.7 | 2.9 | 0 | 0 | 0.28 | 0.0034 | 88 | 6.8 |
| STPD | 5 | 30.5 | 34 | 3 | 46 | 7.1 | 0.29 | 1.5 | 1.3 | 1.5 | 1.3 | 0.3 | 0.0061 | 92 | 2.0 |
| STPD | 6 | 27.8 | 28 | 2 | 44 | 7.2 | 0.43 | 4.7 | 6.6 | 4.7 | 6.6 | 0.35 | 0.0016 | 90 | 5.5 |
| STPD | 7 | 42.4 | 41 | 2 | 58 | 6.8 | 0.015 | 9.6 | 6.6 | 9.6 | 6.6 | 0.26 | 0.038 | 90 | 14 |
| STPD | 8 | 36.6 | 36 | 3 | 65 | 6.8 | 0.24 | 4.4 | 1.8 | 4.4 | 1.8 | 0.28 | 0.0069 | 84 | 3.1 |
| STPD | 9 | 30.4 | 28 | 3 | 74 | 7.2 | 0.17 | 5.6 | 0.57 | 4.7 | 1.7 | 0.34 | 0.006 | 89 | 17 |
| STPD | 10 | 33.1 | 30 | 3 | 59 | 7.3 | 0.18 | 7.7 | 1.9 | 6.9 | 1.4 | 0.4 | 0.0046 | 82 | 8.7 |
| STPD | 11 | 35.0 | 44 | 4 | 87 | 7.1 | 0.14 | 1.6 | 2.2 | 1.1 | 1.2 | 0.29 | 0.0054 | 94 | 5.9 |
| STPD | 12 | 35.4 | 34 | 2 | 53 | 7.1 | 0.22 | 3.6 | 2.0 | 3.6 | 2.0 | 0.29 | 0.0056 | 88 | 2.2 |
| STPD | 13 | 43.0 | 42 | 2 | 40 | 7.3 | 0.11 | 4.2 | 5.9 | 2.8 | 3.9 | 0.31 | 0.0075 | 46 | 37 |
| STPD | 14 | 29.6 | 30 | 4 | 74 | 7.3 | 0.16 | 16 | 19 | 11 | 12 | 0.36 | 0.0065 | 91 | 7.2 |
| STPD | 15 | 36.8 | 33 | 2 | 65 | 7.3 | 0.14 | 2.7 | 0.5 | 2.7 | 0.5 | 0.34 | 0.01 | 90 | 5.9 |
| STPD | 16 | 47.1 | 40 | 4 | 93 | 6.9 | 0.088 | 23 | 20 | 5.5 | 4.0 | 0.28 | 0.0026 | 90 | 8.4 |
| ERIMF | 4 | 9.7 | 7.6 | 2 | 44 | 7.0 | 0.23 | 0 | 0 | 0 | 0 | 0.24 | 0.013 | 87 | 0.94 |
| ERIMF | 5 | 7.9 | 9.3 | 4 | 89 | 7.4 | 0.17 | 1.1 | 2.2 | 1.1 | 2.2 | 0.35 | 0.006 | 98 | 5.0 |
| ERIMF | 6 | 4.7 | 3.8 | 1 | 13 | 6.7 | | 14 | | 14 | | 0.32 | | 88 | |
| ERIMF | 7 | 5.8 | 5.7 | 2 | 22 | 7.2 | 0.0074 | 21 | 9.5 | 16 | 3.0 | 0.37 | 0.016 | 70 | 2.3 |
| ERIMF | 8 | 14.4 | 12 | 1 | 10 | 7.4 | | 0 | | 0 | | 0.4 | | 83 | |
| ERIMF | 9 | 10.3 | 7.7 | 1 | 4.0 | 7.5 | | 0 | | 0 | | 0.42 | | 100 | |
| ERIMF | 10 | 9.1 | 2 | 2 | 52 | 7.4 | 0.18 | 6.8 | 6.5 | 5.4 | 4.5 | 0.34 | 0.0011 | 95 | 3.7 |
| ERIMF | 11 | 10.2 | 12 | 1 | 23 | 6.7 | | 32 | | 24 | | 0.35 | | 64 | |
| ERIMF | 12 | 8.5 | 6.7 | 2 | 39 | 6.5 | 0.16 | 51 | 22 | 47 | 27 | 0.33 | 0.045 | 42 | 12 |
| ERIMF | 13 | 5.0 | 5.3 | 1 | 15 | 6.7 | | 44 | | 44 | | 0.39 | | 78 | |
| ERIMF | 14 | 23.2 | 20 | 2 | 38 | 7.0 | 0.44 | 7.1 | 10 | 2.4 | 3.4 | 0.45 | 0.26 | 59 | 27 |
| ERIMF | 15 | 8.4 | 6.4 | 2 | 24 | 7.1 | 0.46 | 20 | 19 | 13 | 13 | 0.3 | 0.015 | 94 | 5.7 |
| ERIMF | 16 | 8.5 | 8.4 | 1 | 24 | 6.6 | | 50 | | 39 | | 0.3 | | 79 | |

| | | | | | | | | | | | | | | | |
|-------|----|------|-----|---|-----|-----|-------|------|------|------|------|------|---------|-----|------|
| LNLK | 11 | 1.5 | 1.2 | 4 | 87 | 7.5 | 0.097 | 8.3 | 15 | 4.4 | 7.5 | 0.4 | 0.0096 | 95 | 4.2 |
| LNLK | 12 | 1.5 | 1.4 | 2 | 71 | 7.3 | 0.22 | 3.7 | 5.2 | 1.2 | 1.7 | 0.41 | 0.001 | 91 | 13 |
| LNLK | 13 | 1.8 | 1.3 | 4 | 82 | 7.4 | 0.031 | 0.68 | 1.4 | 0.68 | 1.4 | 0.38 | 0.035 | 81 | 13 |
| LNLK | 14 | 1.7 | 1.4 | 4 | 36 | 7.5 | 0.16 | 1.7 | 3.3 | 0.56 | 1.1 | 0.36 | 0.021 | 93 | 6.0 |
| LNLK | 15 | 2.1 | 1.4 | 4 | 43 | 7.3 | 0.17 | 1.7 | 3.5 | 0.58 | 1.2 | 0.35 | 0.04 | 85 | 9.3 |
| LNLK | 16 | 1.8 | 1.5 | 1 | 12 | 6.6 | | 100 | | 43 | | 0.41 | | 18 | |
| LNLK | 17 | 2.6 | 2 | 2 | 39 | 7.5 | 0.15 | 0 | 0 | 0 | 0 | 0.35 | 0.0076 | 94 | 3.4 |
| LNLK | 18 | 1.8 | 1.7 | 1 | 6.5 | 6.9 | | 9.1 | | 9.1 | | 0.37 | | 100 | |
| LNLK | 19 | 1.6 | 1.6 | 4 | 45 | 7.3 | 0.12 | 0 | 0 | 0 | 0 | 0.41 | 0.036 | 87 | 10.0 |
| LNLK | 20 | 2.0 | 1.6 | 2 | 26 | 7.3 | 0.049 | 0 | 0 | 0 | 0 | 0.38 | 0.0037 | 99 | 1.4 |
| ERWSF | 1 | 16.9 | 20 | 2 | 67 | 7.5 | 0.057 | 5.7 | 4.2 | 0 | 0 | 0.36 | 0.0081 | 69 | 7.1 |
| ERWSF | 2 | 12.9 | 13 | 2 | 68 | 6.5 | 0.078 | 20 | 6.3 | 18 | 6.2 | 0.22 | 0.00036 | 85 | 17 |
| ERWSF | 3 | 14.3 | 11 | 3 | 69 | 6.8 | 0.064 | 2.0 | 1.9 | 2.0 | 1.9 | 0.22 | 0.013 | 94 | 5.2 |
| ER | 1 | 24.4 | 22 | 4 | 41 | 7.4 | 0.14 | 4.9 | 1.6 | 2.3 | 1.7 | 0.4 | 0.027 | 95 | 3.0 |
| ER | 2 | 16.8 | 18 | 4 | 71 | 7.5 | 0.27 | 2.0 | 2.8 | 1.5 | 1.9 | 0.44 | 0.0057 | 94 | 7.9 |
| ER | 3 | 30.3 | 25 | 1 | 5.7 | 7.0 | | 60 | | 20 | | 0.31 | | 23 | |
| ER | 4 | 27.8 | 22 | 3 | 90 | 7.5 | 0.026 | 0.69 | 1.2 | 0.69 | 1.2 | 0.34 | 0.0068 | 93 | 4.5 |
| ER | 5 | 38.9 | 27 | 4 | 76 | 7.5 | 0.085 | 2.0 | 1.6 | 0 | 0 | 0.35 | 0.0038 | 97 | 3.0 |
| ER | 6 | 18.7 | 19 | 4 | 62 | 7.4 | 0.084 | 1.6 | 1.1 | 1.6 | 1.1 | 0.28 | 0.024 | 92 | 7.1 |
| ER | 7 | 5.9 | 14 | 4 | 76 | 7.6 | 0.064 | 2.2 | 1.8 | 1.7 | 1.1 | 0.32 | 0.019 | 92 | 3.4 |
| ER | 8 | 40.4 | 36 | 4 | 77 | 7.9 | 0.14 | 1.5 | 2.0 | 1.0 | 1.2 | 0.44 | 0.0068 | 99 | 1.9 |
| ER | 9 | 35.2 | 26 | 4 | 85 | 7.9 | 0.063 | 0.99 | 1.1 | 0.45 | 0.91 | 0.36 | 0.011 | 97 | 4.1 |
| ER | 10 | 27.3 | 16 | 4 | 57 | 7.5 | 0.15 | 6.9 | 2.9 | 5.8 | 2.2 | 0.36 | 0.0062 | 90 | 5.1 |
| ER | 11 | 19.6 | 18 | 4 | 87 | 7.5 | 0.027 | 2.1 | 1.7 | 2.1 | 1.7 | 0.32 | 0.0073 | 96 | 3.4 |
| ER | 12 | 41.3 | 38 | 4 | 82 | 7.7 | 0.098 | 2.7 | 3.3 | 1.6 | 2.1 | 0.32 | 0.013 | 97 | 4.7 |
| ER | 13 | 25.8 | 23 | 4 | 85 | 7.9 | 0.031 | 1.6 | 1.1 | 1.0 | 1.2 | 0.36 | 0.035 | 95 | 6.2 |
| ER | 14 | 22.7 | 16 | 4 | 75 | 7.8 | 0.17 | 3.8 | 0.98 | 3.8 | 0.98 | 0.46 | 0.016 | 93 | 6.2 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| STPD | 1 | B | 32 | 30 | 2 | 1 | 22 | 2 | 0 | 0 | 1 |
| | | | | | | | 3 | 0 | 0 | 1 | 0 |
| STPD | 1 | C | 40 | 38 | 2 | 2 | 22 | 3 | 3 | 0 | 0 |
| | | | | | | | 27 | 3 | 3 | 0 | 0 |
| STPD | 1 | D | 42 | 42 | 0 | 0 | N/A | | | | |
| STPD | 1 | E | 40 | 40 | 0 | 0 | N/A | | | | |
| STPD | 2 | B | 50 | 49 | 1 | 1 | 49 | 1 | 1 | 3 | 3 |
| STPD | 2 | C | 40 | 40 | 0 | 0 | N/A | | | | |
| STPD | 2 | D | 45 | 44 | 1 | 1 | 23 | 2 | 1 | 0 | 2 |
| STPD | 2 | E | 50 | 50 | 0 | 0 | N/A | | | | |
| STPD | 3 | B | 25 | 25 | 0 | 0 | N/A | | | | |
| STPD | 3 | C | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 3 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 3 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 4 | B | 46 | 46 | 0 | 0 | N/A | | | | |
| STPD | 4 | C | 40 | 38 | 2 | 0 | 14 | 0 | 1 | 0 | 0 |
| | | | | | | | 31 | 0 | 0 | 1 | 0 |
| STPD | 4 | D | 44 | 44 | 0 | 0 | N/A | | | | |
| STPD | 4 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 5 | B | 47 | 46 | 1 | 1 | 11 | 3 | 3 | 0 | 3 |
| STPD | 5 | C | 45 | 45 | 0 | 0 | N/A | | | | |
| STPD | 5 | D | 44 | 43 | 1 | 1 | 30 | 3 | 1 | 0 | 1 |
| STPD | 5 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 6 | B | 43 | 39 | 4 | 4 | 4 | 3 | 0 | 0 | 0 |
| | | | | | | | 5 | 3 | 3 | 0 | 0 |
| | | | | | | | 10 | 2 | 1 | 0 | 3 |
| | | | | | | | 15 | 2 | 3 | 0 | 3 |
| STPD | 6 | C | 15 | 15 | 0 | 0 | N/A | | | | |
| STPD | 6 | D | N/A | N/A | N/A | N/A | N/A | | | | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|--|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema | |
| STPD | 6 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 7 | B | 40 | 38 | 2 | 2 | 5 | 0 | 1 | 1 | 2 | |
| | | | | | | | 10 | 3 | 0 | 3 | 0 | |
| STPD | 7 | C | 7 | 6 | 1 | 1 | 7 | 0 | 0 | 3 | 1 | |
| STPD | 7 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 7 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 8 | B | 43 | 41 | 2 | 2 | 19 | 3 | 3 | 3 | 3 | |
| | | | | | | | 25 | 3 | 3 | 0 | 0 | |
| STPD | 8 | C | 40 | 39 | 1 | 1 | 29 | 2 | 0 | 0 | 2 | |
| STPD | 8 | D | 33 | 31 | 2 | 2 | 1 | 3 | 0 | 0 | 0 | |
| | | | | | | | 2 | 3 | 2 | 3 | 2 | |
| STPD | 8 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 9 | B | 35 | 33 | 2 | 1 | 10 | 0 | 0 | 0 | 1 | |
| | | | | | | | 18 | 0 | 3 | 0 | 0 | |
| STPD | 9 | C | 49 | 46 | 3 | 3 | 23 | 2 | 0 | 0 | 0 | |
| | | | | | | | 25 | 3 | 3 | 2 | 3 | |
| | | | | | | | 40 | 3 | 3 | 3 | 3 | |
| STPD | 9 | D | 40 | 38 | 2 | 2 | 24 | 0 | 1 | 1 | 3 | |
| | | | | | | | 28 | 0 | 2 | 0 | 0 | |
| STPD | 9 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 10 | B | 36 | 34 | 2 | 2 | 9 | 3 | 0 | 0 | 0 | |
| | | | | | | | 27 | 2 | 0 | 0 | 0 | |
| STPD | 10 | C | 44 | 40 | 4 | 3 | 2 | 3 | 0 | 0 | 0 | |
| | | | | | | | 3 | 3 | 0 | 0 | 0 | |
| | | | | | | | 16 | 0 | 0 | 0 | 1 | |
| | | | | | | | 17 | 0 | 1 | 0 | 2 | |
| STPD | 10 | D | 12 | 11 | 1 | 1 | 2 | 2 | 3 | 0 | 1 | |
| STPD | 10 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| STPD | 11 | B | 44 | 42 | 2 | 1 | 19 | 3 | 0 | 0 | 1 | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 37 | 0 | 0 | 0 | 1 |
| STPD | 11 | C | 49 | 48 | 1 | 1 | 5 | 3 | 0 | 0 | 0 |
| STPD | 11 | D | 45 | 45 | 0 | 0 | N/A | | | | |
| STPD | 11 | E | 50 | 50 | 0 | 0 | N/A | | | | |
| STPD | 12 | B | 45 | 44 | 1 | 1 | 25 | 3 | 2 | 3 | 3 |
| STPD | 12 | C | 20 | 19 | 1 | 1 | 3 | 1 | 1 | | 1 |
| STPD | 12 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 12 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 13 | B | 36 | 33 | 3 | 2 | 4 | 3 | 0 | 0 | 2 |
| | | | | | | | 6 | 0 | 0 | 0 | 1 |
| | | | | | | | 26 | 0 | 0 | 0 | 2 |
| STPD | 13 | C | 1 | 1 | 0 | 0 | N/A | | | | |
| STPD | 13 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 13 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 14 | B | 50 | 48 | 2 | 2 | 5 | 3 | 0 | 0 | 0 |
| | | | | | | | 31 | 2 | 0 | 0 | 2 |
| STPD | 14 | C | 47 | 27 | 20 | 13 | 1 | 1 | 0 | 0 | 0 |
| | | | | | | | 2 | 1 | 0 | 0 | 0 |
| | | | | | | | 3 | 1 | 0 | 0 | 0 |
| | | | | | | | 8 | 1 | 0 | 0 | 0 |
| | | | | | | | 15 | 2 | 0 | 0 | 0 |
| | | | | | | | 16 | 3 | 0 | 0 | 0 |
| | | | | | | | 17 | 2 | 0 | 0 | 0 |
| | | | | | | | 21 | 2 | 0 | 0 | 0 |
| | | | | | | | 22 | 3 | 0 | 0 | 0 |
| | | | | | | | 23 | 2 | 0 | 0 | 0 |
| | | | | | | | 26 | 3 | 0 | 0 | 0 |
| | | | | | | | 27 | 2 | 0 | 0 | 0 |
| | | | | | | | 28 | 1 | 0 | 0 | 0 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 29 | 1 | 0 | 0 | 0 |
| | | | | | | | 32 | 3 | 0 | 0 | 0 |
| | | | | | | | 33 | 3 | 0 | 0 | 0 |
| | | | | | | | 39 | 3 | 0 | 0 | 0 |
| | | | | | | | 41 | 3 | 0 | 0 | 0 |
| | | | | | | | 42 | 2 | 0 | 0 | 0 |
| | | | | | | | 43 | 1 | 0 | 0 | 0 |
| STPD | 14 | D | 42 | 34 | 8 | 6 | 2 | 3 | 2 | 0 | 3 |
| | | | | | | | 15 | 2 | 0 | 0 | 2 |
| | | | | | | | 26 | 2 | 0 | 0 | 1 |
| | | | | | | | 30 | 3 | 3 | 3 | 3 |
| | | | | | | | 39 | 2 | 3 | 2 | 3 |
| | | | | | | | 40 | 2 | 0 | 0 | 0 |
| | | | | | | | 41 | 1 | 0 | 0 | 0 |
| | | | | | | | 42 | 1 | 0 | 0 | 0 |
| STPD | 14 | E | 26 | 26 | 0 | 0 | N/A | | | | |
| STPD | 15 | B | 43 | 42 | 1 | 1 | 40 | 0 | 2 | 0 | 2 |
| STPD | 15 | C | 33 | 32 | 1 | 1 | 25 | 3 | 2 | 0 | 2 |
| STPD | 15 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 15 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| STPD | 16 | B | 46 | 42 | 4 | 1 | 39 | 1 | 0 | 0 | 0 |
| | | | | | | | 40 | 1 | 0 | 0 | 0 |
| | | | | | | | 41 | 1 | 0 | 0 | 0 |
| | | | | | | | 44 | 2 | 0 | 0 | 0 |
| STPD | 16 | C | 39 | 36 | 3 | 3 | 27 | 3 | 0 | 0 | 0 |
| | | | | | | | 38 | 3 | 0 | 0 | 0 |
| | | | | | | | 39 | 2 | 0 | 0 | 0 |
| STPD | 16 | D | 49 | 37 | 12 | 1 | 19 | 1 | 0 | 0 | 0 |
| | | | | | | | 20 | 1 | 0 | 0 | 0 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 25 | 1 | 0 | 0 | 0 |
| | | | | | | | 30 | 0 | 0 | 0 | 1 |
| | | | | | | | 36 | 1 | 0 | 0 | 0 |
| | | | | | | | 37 | 0 | 0 | 0 | 1 |
| | | | | | | | 39 | 1 | 0 | 0 | 0 |
| | | | | | | | 40 | 1 | 0 | 0 | 0 |
| | | | | | | | 42 | 2 | 0 | 0 | 0 |
| | | | | | | | 43 | 1 | 0 | 0 | 0 |
| | | | | | | | 45 | 1 | 0 | 0 | 0 |
| | | | | | | | 47 | 1 | 0 | 0 | 0 |
| STPD | 16 | E | 20 | 10 | 10 | 2 | 1 | 1 | 0 | 0 | 0 |
| | | | | | | | 2 | 1 | 0 | 0 | 0 |
| | | | | | | | 3 | 1 | 0 | 0 | 0 |
| | | | | | | | 5 | 1 | 0 | 0 | 0 |
| | | | | | | | 12 | 2 | 0 | 0 | 0 |
| | | | | | | | 13 | 3 | 3 | 1 | 3 |
| | | | | | | | 15 | 1 | 0 | 0 | 0 |
| | | | | | | | 17 | 1 | 0 | 0 | 0 |
| | | | | | | | 18 | 1 | 0 | 0 | 0 |
| | | | | | | | 19 | 1 | 0 | 0 | 0 |
| ERIMF | 4 | B | 13 | 13 | 0 | 0 | N/A | | | | |
| ERIMF | 4 | C | 44 | 44 | 0 | 0 | N/A | | | | |
| ERIMF | 4 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 4 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 5 | B | 51 | 51 | 0 | 0 | N/A | | | | |
| ERIMF | 5 | C | 45 | 45 | 0 | 0 | N/A | | | | |
| ERIMF | 5 | D | 50 | 50 | 0 | 0 | N/A | | | | |
| ERIMF | 5 | E | 23 | 22 | 1 | 1 | 5 | 3 | 0 | 3 | 3 |
| ERIMF | 6 | B | 7 | 6 | 1 | 1 | 1 | 0 | 1 | 0 | 2 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|--|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema | |
| ERIMF | 6 | C | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 6 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 6 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 7 | B | 36 | 31 | 5 | 5 | 10 | 3 | 0 | 0 | 0 | |
| | | | | | | | 23 | 0 | 3 | 0 | 2 | |
| | | | | | | | 29 | 1 | 2 | 0 | 2 | |
| | | | | | | | 30 | 0 | 0 | 0 | 2 | |
| | | | | | | | 33 | 3 | 0 | 0 | 1 | |
| ERIMF | 7 | C | 11 | 8 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | |
| | | | | | | | 3 | 2 | 0 | 0 | 0 | |
| | | | | | | | 7 | 0 | 0 | 0 | 1 | |
| ERIMF | 7 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 7 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 8 | B | 19 | 19 | 0 | 0 | N/A | | | | | |
| ERIMF | 8 | C | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 8 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 8 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 9 | B | 4 | 4 | 0 | 0 | N/A | | | | | |
| ERIMF | 9 | C | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 9 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 9 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 10 | B | 46 | 45 | 1 | 1 | 40 | 2 | 0 | 0 | 0 | |
| | | | | | | | 1 | 1 | 0 | 0 | 0 | |
| | | | | | | | 22 | 3 | 0 | 0 | 0 | |
| | | | | | | | 28 | 2 | 0 | 0 | 0 | |
| ERIMF | 10 | C | 35 | 31 | 4 | 3 | 32 | 3 | 2 | 0 | 1 | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| ERIMF | 10 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 10 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERIMF | 11 | B | 25 | 17 | 8 | 6 | 7 | 0 | 0 | 0 | 2 | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 10 | 2 | 3 | 0 | 3 |
| | | | | | | | 12 | 3 | 1 | 0 | 1 |
| | | | | | | | 14 | 3 | 1 | 1 | 3 |
| | | | | | | | 15 | 2 | 2 | 0 | 3 |
| | | | | | | | 18 | 0 | 0 | 0 | 1 |
| | | | | | | | 22 | 3 | 0 | 0 | 1 |
| | | | | | | | 25 | 0 | 0 | 0 | 1 |
| ERIMF | 11 | C | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 11 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 11 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 12 | B | 25 | 16 | 9 | 7 | 1 | 2 | 0 | 0 | 2 |
| | | | | | | | 7 | 3 | 3 | 2 | 3 |
| | | | | | | | 10 | 3 | 3 | 0 | 3 |
| | | | | | | | 13 | 0 | 0 | 0 | 1 |
| | | | | | | | 15 | 1 | 0 | 0 | 0 |
| | | | | | | | 16 | 2 | 3 | 0 | 3 |
| | | | | | | | 23 | 1 | 0 | 0 | 2 |
| | | | | | | | 24 | 3 | 0 | 0 | 0 |
| | | | | | | | 25 | 2 | 0 | 0 | 1 |
| ERIMF | 12 | C | 3 | 1 | 2 | 2 | 2 | 2 | 0 | 0 | 3 |
| | | | | | | | 3 | 0 | 1 | 2 | 3 |
| ERIMF | 12 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 12 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 13 | B | 18 | 10 | 8 | 8 | 1 | 3 | 3 | 0 | 3 |
| | | | | | | | 3 | 3 | 3 | 0 | 3 |
| | | | | | | | 4 | 2 | 3 | 0 | 3 |
| | | | | | | | 8 | 0 | 0 | 0 | 2 |
| | | | | | | | 10 | 0 | 0 | 0 | 2 |
| | | | | | | | 12 | 0 | 1 | 0 | 2 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 17 | 0 | 1 | 0 | 3 |
| | | | | | | | 18 | 0 | 0 | 0 | 2 |
| ERIMF | 13 | C | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 13 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 13 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 14 | B | 20 | 20 | 0 | 0 | N/A | | | | |
| ERIMF | 14 | C | 21 | 18 | 3 | 1 | 6 | 3 | 0 | 0 | 0 |
| | | | | | | | 9 | 0 | 0 | 0 | 1 |
| | | | | | | | 18 | 1 | 0 | 0 | 0 |
| ERIMF | 14 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 14 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 15 | B | 49 | 46 | 3 | 2 | 32 | 2 | 3 | 2 | 3 |
| | | | | | | | 43 | 2 | 0 | 0 | 0 |
| | | | | | | | 49 | 0 | 0 | 0 | 1 |
| ERIMF | 15 | C | 9 | 6 | 3 | 2 | 4 | 3 | 0 | 0 | 0 |
| | | | | | | | 5 | 0 | 0 | 0 | 2 |
| | | | | | | | 49 | 1 | 0 | 0 | 0 |
| ERIMF | 15 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 15 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 16 | B | 38 | 19 | 19 | 15 | 1 | 3 | 3 | 3 | 3 |
| | | | | | | | 2 | 3 | 0 | 3 | 3 |
| | | | | | | | 3 | 2 | 1 | 0 | 3 |
| | | | | | | | 4 | 1 | 2 | 0 | 2 |
| | | | | | | | 9 | 0 | 2 | 0 | 2 |
| | | | | | | | 10 | 1 | 0 | 0 | 2 |
| | | | | | | | 12 | 3 | 0 | 0 | 0 |
| | | | | | | | 13 | 1 | 0 | 0 | 0 |
| | | | | | | | 15 | 2 | 0 | 0 | 0 |
| | | | | | | | 18 | 2 | 0 | 0 | 0 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 20 | 1 | 0 | 0 | 0 |
| | | | | | | | 26 | 2 | 1 | 0 | 3 |
| | | | | | | | 27 | 3 | 3 | 0 | 3 |
| | | | | | | | 29 | 2 | 0 | 0 | 1 |
| | | | | | | | 30 | 0 | 0 | 0 | 1 |
| | | | | | | | 33 | 2 | 0 | 0 | 0 |
| | | | | | | | 36 | 2 | 0 | 0 | 1 |
| | | | | | | | 37 | 3 | 0 | 0 | 1 |
| | | | | | | | 38 | 1 | 0 | 0 | 0 |
| ERIMF | 16 | C | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 16 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ERIMF | 16 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| LNLK | 11 | B | 45 | 31 | 14 | 7 | 16 | 1 | 0 | 0 | 0 |
| | | | | | | | 23 | 1 | 0 | 0 | 0 |
| | | | | | | | 33 | 1 | 0 | 0 | 0 |
| | | | | | | | 34 | 1 | 0 | 0 | 0 |
| | | | | | | | 35 | 3 | 2 | 2 | 0 |
| | | | | | | | 37 | 1 | 0 | 0 | 0 |
| | | | | | | | 38 | 2 | 0 | 0 | 0 |
| | | | | | | | 39 | 1 | 0 | 0 | 0 |
| | | | | | | | 40 | 2 | 0 | 0 | 0 |
| | | | | | | | 41 | 1 | 0 | 0 | 0 |
| | | | | | | | 42 | 2 | 0 | 0 | 0 |
| | | | | | | | 43 | 2 | 0 | 0 | 0 |
| | | | | | | | 44 | 2 | 3 | 0 | 3 |
| | | | | | | | 45 | 2 | 0 | 0 | 0 |
| LNLK | 11 | C | 52 | 51 | 1 | 1 | 18 | 0 | 0 | 0 | 2 |
| LNLK | 11 | D | 48 | 48 | 0 | 0 | N/A | | | | |
| LNLK | 11 | E | 47 | 47 | 0 | 0 | N/A | | | | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| LNLK | 12 | B | 41 | 38 | 3 | 1 | 6 | 0 | 2 | 0 | 2 |
| | | | | | | | 29 | 1 | 0 | 0 | 0 |
| | | | | | | | 32 | 1 | 0 | 0 | 0 |
| LNLK | 12 | C | 37 | 37 | 0 | 0 | N/A | | | | |
| LNLK | 12 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| LNLK | 12 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| LNLK | 13 | B | 49 | 49 | 0 | 0 | N/A | | | | |
| LNLK | 13 | C | 41 | 41 | 0 | 0 | N/A | | | | |
| LNLK | 13 | D | 37 | 36 | 1 | 1 | 35 | 0 | 0 | 0 | 2 |
| LNLK | 13 | E | 34 | 34 | 0 | 0 | N/A | | | | |
| LNLK | 14 | B | 43 | 43 | 0 | 0 | N/A | | | | |
| LNLK | 14 | C | 47 | 47 | 0 | 0 | N/A | | | | |
| LNLK | 14 | D | 45 | 42 | 3 | 1 | 22 | 0 | 0 | 0 | 1 |
| | | | | | | | 36 | 0 | 0 | 0 | 1 |
| | | | | | | | 40 | 0 | 2 | 1 | 3 |
| LNLK | 14 | E | 4 | 4 | 0 | 0 | N/A | | | | |
| LNLK | 15 | B | 43 | 40 | 3 | 1 | 18 | 0 | 0 | 0 | 1 |
| | | | | | | | 35 | 0 | 0 | 0 | 1 |
| | | | | | | | 43 | 3 | 2 | 0 | 2 |
| LNLK | 15 | C | 40 | 40 | 0 | 0 | N/A | | | | |
| LNLK | 15 | D | 49 | 49 | 0 | 0 | N/A | | | | |
| LNLK | 15 | E | 10 | 10 | 0 | 0 | N/A | | | | |
| LNLK | 16 | B | 7 | 0 | 7 | 3 | 1 | 0 | 1 | 0 | 0 |
| | | | | | | | 2 | 0 | 0 | 0 | 1 |
| | | | | | | | 3 | 2 | 0 | 0 | 1 |
| | | | | | | | 4 | 2 | 2 | 0 | 3 |
| | | | | | | | 5 | 0 | 0 | 0 | 1 |
| | | | | | | | 6 | 3 | 3 | 0 | 1 |
| | | | | | | | 7 | 0 | 0 | 0 | 1 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|--|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema | |
| LNLK | 16 | C | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 16 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 16 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 17 | B | 46 | 46 | 0 | 0 | N/A | | | | | |
| LNLK | 17 | C | 30 | 30 | 0 | 0 | N/A | | | | | |
| LNLK | 17 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 17 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 18 | B | 11 | 10 | 1 | 1 | 11 | 3 | 1 | 2 | 1 | |
| LNLK | 18 | C | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 18 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 18 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 19 | B | 47 | 47 | 0 | 0 | N/A | | | | | |
| LNLK | 19 | C | 42 | 42 | 0 | 0 | N/A | | | | | |
| LNLK | 19 | D | 48 | 48 | 0 | 0 | N/A | | | | | |
| LNLK | 19 | E | 29 | 29 | 0 | 0 | N/A | | | | | |
| LNLK | 20 | B | 49 | 49 | 0 | 0 | N/A | | | | | |
| LNLK | 20 | C | 10 | 10 | 0 | 0 | N/A | | | | | |
| LNLK | 20 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| LNLK | 20 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERWSF | 1 | B | 37 | 36 | 1 | 0 | 24 | 1 | 0 | 0 | 0 | |
| ERWSF | 1 | C | 23 | 21 | 2 | 0 | 8 | 1 | 0 | 0 | 0 | |
| | | | | | | | 9 | 1 | 0 | 0 | 0 | |
| ERWSF | 1 | D | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERWSF | 1 | E | N/A | N/A | N/A | N/A | N/A | | | | | |
| ERWSF | 2 | B | 44 | 32 | 12 | 11 | 5 | 0 | 0 | 0 | 1 | |
| | | | | | | | 17 | 0 | 2 | 0 | 0 | |
| | | | | | | | 20 | 2 | 0 | 1 | 2 | |
| | | | | | | | 23 | 3 | 0 | 0 | 3 | |
| | | | | | | | 27 | 2 | 0 | 2 | 3 | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|-------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 31 | 3 | 0 | 0 | 3 |
| | | | | | | | 32 | 3 | 2 | 0 | 3 |
| | | | | | | | 34 | 2 | 0 | 0 | 3 |
| | | | | | | | 35 | 3 | 1 | 0 | 1 |
| | | | | | | | 36 | 3 | 0 | 2 | 2 |
| | | | | | | | 37 | 2 | 3 | 2 | 3 |
| | | | | | | | 44 | 0 | 3 | 3 | 3 |
| ERWSF | 2 | C | 31 | 26 | 5 | 4 | 4 | 2 | 0 | 0 | 2 |
| | | | | | | | 13 | 0 | 0 | 0 | 1 |
| | | | | | | | 15 | 3 | 0 | 0 | 0 |
| | | | | | | | 30 | 2 | 0 | 0 | 0 |
| | | | | | | | 31 | 3 | 3 | 2 | 3 |
| ERWSF | 2 | D | 6 | 5 | 1 | 1 | 4 | 2 | 0 | 2 | 1 |
| ERWSF | 2 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ERWSF | 3 | B | 54 | 52 | 2 | 2 | 35 | 3 | 0 | 0 | 0 |
| | | | | | | | 36 | 2 | 2 | 0 | 2 |
| ERWSF | 3 | C | 45 | 44 | 1 | 1 | 1 | 3 | 3 | 2 | 3 |
| ERWSF | 3 | D | 38 | 38 | 0 | 0 | N/A | | | | |
| ERWSF | 3 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ER | 1 | B | 48 | 45 | 3 | 2 | 3 | 3 | 3 | 1 | 3 |
| | | | | | | | 13 | 1 | 0 | 0 | 0 |
| | | | | | | | 42 | 3 | 0 | 1 | 0 |
| ER | 1 | C | 46 | 44 | 2 | 0 | 10 | 1 | 0 | 0 | 0 |
| | | | | | | | 29 | 1 | 0 | 0 | 0 |
| ER | 1 | D | 49 | 46 | 3 | 1 | 9 | 2 | 1 | 0 | 1 |
| | | | | | | | 33 | 1 | 0 | 0 | 0 |
| | | | | | | | 40 | 1 | 0 | 0 | 0 |
| ER | 1 | E | 35 | 34 | 1 | 1 | 18 | 3 | 0 | 1 | 0 |
| ER | 2 | B | 48 | 48 | 0 | 0 | N/A | | | | |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| ER | 2 | C | 51 | 48 | 3 | 2 | 8 | 3 | 1 | 3 | 3 |
| | | | | | | | 12 | 0 | 0 | 0 | 1 |
| | | | | | | | 25 | 2 | 0 | 0 | 0 |
| ER | 2 | D | 48 | 47 | 1 | 1 | 6 | 3 | 3 | 3 | 3 |
| ER | 2 | E | 41 | 41 | 0 | 0 | N/A | | | | |
| ER | 3 | B | 5 | 2 | 3 | 1 | 1 | 0 | 0 | 0 | 1 |
| | | | | | | | 2 | 1 | 0 | 0 | 0 |
| | | | | | | | 3 | 0 | 2 | 1 | 3 |
| ER | 3 | C | N/A | N/A | N/A | N/A | N/A | | | | |
| ER | 3 | D | N/A | N/A | N/A | N/A | N/A | | | | |
| ER | 3 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ER | 4 | B | 48 | 47 | 1 | 1 | 23 | 3 | 0 | 0 | 0 |
| ER | 4 | C | 48 | 48 | 0 | 0 | N/A | | | | |
| ER | 4 | D | 15 | 15 | 0 | 0 | N/A | | | | |
| ER | 4 | E | N/A | N/A | N/A | N/A | N/A | | | | |
| ER | 5 | B | 49 | 48 | 1 | 0 | 30 | 0 | 0 | 0 | 1 |
| ER | 5 | C | 52 | 50 | 2 | 0 | 10 | 1 | 0 | 0 | 0 |
| | | | | | | | 20 | 1 | 0 | 0 | 0 |
| ER | 5 | D | 47 | 46 | 1 | 0 | 40 | 0 | 1 | 0 | 0 |
| ER | 5 | E | 47 | 47 | 0 | 0 | N/A | | | | |
| ER | 6 | B | 49 | 48 | 1 | 1 | 40 | 0 | 2 | 0 | 3 |
| ER | 6 | C | 48 | 47 | 1 | 1 | 25 | 3 | 1 | 0 | 0 |
| ER | 6 | D | 41 | 40 | 1 | 1 | 30 | 3 | 0 | 0 | 0 |
| ER | 6 | E | 12 | 12 | 0 | 0 | N/A | | | | |
| ER | 7 | B | 46 | 45 | 1 | 1 | 35 | 3 | 1 | 1 | 2 |
| ER | 7 | C | 48 | 48 | 0 | 0 | N/A | | | | |
| ER | 7 | D | 45 | 43 | 2 | 1 | 5 | 0 | 2 | 1 | 3 |
| | | | | | | | 45 | 0 | 0 | 0 | 1 |
| ER | 7 | E | 44 | 43 | 1 | 1 | 30 | 0 | 1 | 3 | 3 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| ER | 8 | B | 49 | 49 | 0 | 0 | N/A | | | | |
| ER | 8 | C | 50 | 50 | 0 | 0 | N/A | | | | |
| ER | 8 | D | 48 | 46 | 2 | 1 | 10 | 0 | 0 | 0 | 1 |
| | | | | | | | 25 | 2 | 0 | 0 | 1 |
| ER | 8 | E | 50 | 49 | 1 | 1 | 35 | 3 | 1 | 0 | 0 |
| ER | 9 | B | 55 | 55 | 0 | 0 | N/A | | | | |
| ER | 9 | C | 47 | 47 | 0 | 0 | N/A | | | | |
| ER | 9 | D | 47 | 46 | 1 | 0 | 7 | 0 | 0 | 0 | 1 |
| ER | 9 | E | 55 | 54 | 1 | 1 | 10 | 3 | 0 | 1 | 3 |
| ER | 10 | B | 48 | 43 | 5 | 4 | 1 | 2 | 3 | 0 | 3 |
| | | | | | | | 2 | 3 | 2 | 1 | 3 |
| | | | | | | | 3 | 3 | 2 | 2 | 3 |
| | | | | | | | 5 | 2 | 2 | 1 | 2 |
| | | | | | | | 20 | 0 | 0 | 0 | 1 |
| ER | 10 | C | 42 | 39 | 3 | 2 | 9 | 2 | 1 | 1 | 2 |
| | | | | | | | 10 | 3 | 0 | 0 | 0 |
| | | | | | | | 40 | 0 | 0 | 0 | 1 |
| ER | 10 | D | 44 | 41 | 3 | 3 | 9 | 2 | 3 | 1 | 3 |
| | | | | | | | 10 | 2 | 2 | 2 | 3 |
| | | | | | | | 40 | 2 | 2 | 0 | 3 |
| ER | 10 | E | 30 | 29 | 1 | 1 | 15 | 2 | 1 | 0 | 3 |
| ER | 11 | B | 50 | 49 | 1 | 1 | 30 | 0 | 0 | 0 | 2 |
| ER | 11 | C | 46 | 45 | 1 | 1 | 30 | 1 | 1 | 0 | 3 |
| ER | 11 | D | 48 | 48 | 0 | 0 | N/A | | | | |
| ER | 11 | E | 47 | 45 | 2 | 2 | 24 | 0 | 0 | 0 | 2 |
| | | | | | | | 25 | 3 | 0 | 1 | 1 |
| ER | 12 | B | 53 | 53 | 0 | 0 | N/A | | | | |
| ER | 12 | C | 45 | 42 | 3 | 2 | 19 | 1 | 1 | 0 | 2 |
| | | | | | | | 30 | 0 | 0 | 0 | 2 |

| Site | Female ID | Rep | # fish assessed in replicate | # normal fish | # fish with deformity GSI 1 or more | # fish with deformity GSI 2 or more | GSI | | | | |
|------|-----------|-----|------------------------------|---------------|-------------------------------------|-------------------------------------|---------|----------|--------------|---------|-------|
| | | | | | | | Fish ID | Skeletal | Craniofacial | Finfold | Edema |
| | | | | | | | 35 | 0 | 0 | 0 | 1 |
| ER | 12 | D | 53 | 53 | 0 | 0 | N/A | | | | |
| ER | 12 | E | 48 | 46 | 2 | 1 | 10 | 1 | 2 | 0 | 0 |
| | | | | | | | 15 | 1 | 0 | 0 | 0 |
| ER | 13 | B | 43 | 42 | 1 | 0 | 30 | 0 | 1 | 0 | 0 |
| ER | 13 | C | 47 | 47 | 0 | 0 | N/A | | | | |
| ER | 13 | D | 49 | 48 | 1 | 1 | 5 | 0 | 3 | 3 | 1 |
| ER | 13 | E | 49 | 48 | 1 | 1 | 7 | 0 | 3 | 0 | 1 |
| ER | 14 | B | 50 | 48 | 2 | 2 | 13 | 3 | 3 | 2 | 3 |
| | | | | | | | 46 | 2 | 0 | 0 | 1 |
| ER | 14 | C | 44 | 42 | 2 | 2 | 10 | 1 | 2 | 0 | 3 |
| | | | | | | | 13 | 3 | 3 | 2 | 1 |
| ER | 14 | D | 43 | 42 | 1 | 1 | 21 | 0 | 0 | 1 | 2 |
| ER | 14 | E | 48 | 46 | 2 | 2 | 1 | 0 | 0 | 0 | 3 |
| | | | | | | | 21 | 3 | 3 | 1 | 3 |

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: NA
 Work Order #: 21A

Embryo

Start Date & Time: May 15/19 @ 2:30
 Stop Date & Time: June 5/2019
 Test Species: Redside shiner

| ERIMF1 Concentration | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.5 | 15.2 | 14.5 | 15.0 | 14.5 | 14.0 | | | | | | | | |
| DO (mg/L) | 8.25 | 7.7 | 9.2 | 10.3 | 9.3 | 10.2 | | | | | | | | |
| pH | 7.8 | 7.7 | 7.8 | 7.9 | 7.8 | 7.7 | | | | | | | | |
| Cond. (µS/cm) | 328 | 338 | | 327 | | 341 | | | | | | | | |
| Initials | BPL | CMP | | BPL | | | | | | | | | | |

| ERIMF2 Concentration | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 15.2 | 14.6 | 15.0 | 14.5 | | | | | | | | | |
| DO (mg/L) | 7.5 | 7.7 | 9.1 | 10.3 | 9.2 | | | | | | | | | |
| pH | 7.56 | 7.7 | 7.8 | 7.9 | 7.8 | | | | | | | | | |
| Cond. (µS/cm) | 325 | 338 | | 327 | | | | | | | | | | |
| Initials | BPL | CMP | | BPL | | | | | | | | | | |

| ERIMF3 Concentration | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 15.2 | 14.5 | 15.0 | 14.5 | | | | | | | | | |
| DO (mg/L) | 7.5 | 7.7 | 9.1 | 10.3 | 9.3 | | | | | | | | | |
| pH | 7.7 | 7.7 | 7.8 | 7.9 | 7.8 | | | | | | | | | |
| Cond. (µS/cm) | 326 | 338 | | 327 | | | | | | | | | | |
| Initials | BPL | CMP | | BPL | | | | | | | | | | |

| * ERIMF4 Concentration | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 15.2 | 14.5 | 15.0 | 14.5 | 15.0 | 15.0 | 15.0 | 15.0 | 14.5 | 14.0 | 14.0 | 13.5 | |
| DO (mg/L) | 8.0 | 7.7 | 9.3 | 10.3 | 9.3 | 10.0 | 9.8 | 10.0 | 9.8 | 10.2 | 10.3 | 10.2 | 10.1 | |
| pH | 7.7 | 7.7 | 7.7 | 7.9 | 7.8 | 7.6 | 7.5 | 7.6 | 7.7 | 7.5 | 7.5 | 7.7 | 7.7 | |
| Cond. (µS/cm) | 337 | 338 | | 327 | | 339 | | 340 | | 338 | | 341 | | |
| Initials | BPL | CMP | | BPL | | | | | | im | | CMP | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/ALY/CMP
YVL/KJL
 Reviewed by: SS
 Date reviewed: 2019/12/19

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/C

Embryo

Start Date & Time: May 15/19 @ 20:30
 Stop Date & Time: Same 5/22/19
 Test Species: Redside shiner

| STP/DO1 Concentration | Days | | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.5 | 15.0 | 14.7 | 15.0 | 14.5 | 15.0 | 14.5 | 15.0 | 15.0 | 14.5 | 14.0 | 14.0 | 13.5 | |
| DO (mg/L) | 8.5 | 9.1 | 9.3 | 10.3 | 9.2 | 10.0 | 9.8 | 10.0 | 9.8 | 10.2 | 10.2 | 10.2 | 10.1 | |
| pH | 7.8 | 7.7 | 7.8 | 7.8 | 7.8 | 7.6 | 7.5 | 7.6 | 7.6 | 7.5 | 7.5 | 7.7 | 7.7 | |
| Cond. (µS/cm) | 331 | 338 | | 329 | | 339 | | 340 | | 330 | | 341 | | |
| Initials | BPL | CMF | | BPL | | CMF | | CMF | | CMF | | CMF | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-7 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/AWD/CMF
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal MM Hatch Embryo BC
 Sample ID: N/A Start Date & Time: May 15/19 @ 2030
 Work Order #: _____ Stop Date & Time: June 5/2019
Test Species: Redside shiner

| ERIMF4 Concentration | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 13.4 | 13.5 | 14.0 | 13.5 | |
| DO (mg/L) | | 10.2 | 9.9 | 10.1 | 10.0 | 10.3 | 10.1 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 9.9 | |
| pH | | 7.6 | 7.6 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | 339 | | 339 | | 338 | | 338 | | 338 | | 336 | | |
| Initials | | CME | | CME | | CME | | BC | | r | | CME | | |

| STP DO1 Concentration | Days | | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | |
| DO (mg/L) | | 10.2 | 10.0 | 10.1 | 9.9 | 10.3 | 10.2 | 10.3 | 10.0 | 9.9 | 9.9 | 10.1 | 9.8 | |
| pH | | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | 339 | | 339 | | 338 | | 338 | | 338 | | 336 | | |
| Initials | | CME | | CME | | CME | | BC | | r | | CME | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

Analysts: BPL/ALD/CME
YYL/RJL
 Reviewed by: SS
 Date reviewed: 2019/12/18

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teek Coal MK Hatch Emb-10 BR Start Date & Time: May 15/19 @ 2030
 Sample ID: N/A BR Stop Date & Time: June 5/2019
 Work Order #: N/A BR Test Species: Oreochromis mykiss BR

Red side shank

| ECMP4 Concentration | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 9.9 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.6 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | | |
| Initials | | CML | | WMBR | | KVL | | KVL | | BR | | BR | | |

| STPDI Concentration | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.0 | 12.0 | 9.9 | 10.0 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.5 | 7.6 | 7.6 | 7.6 | 7.5 | |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | | |
| Initials | | CML | | WMBR | | KVL | | KVL | | BR | | BR | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: COND-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/AWD/CMP
YYL/KSL
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tock Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 15/2015
 Stop Date & Time: June 5/2015
 Test Species: Oncorhynchus mykiss
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|---|--|---|--|----|--|----|--|----|--|--|--|--|
| | init. | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| ERINE-04 | / | | | | | | | | | | | | | |
| Temperature (°C) | / | | | | | | | | | | | | | |
| DO (mg/L) | / | | | | | | | | | | | | | |
| pH | / | | | | | | | | | | | | | |
| Cond. (µS/cm) | / | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|---------|---|---------|---|------|------|---------|------|---------|------|------|--|--|
| | init. | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| STPD-01 | / | | | | | | | | | | | | | |
| Temperature (°C) | / | 14.0 | / | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | / | 10.0 | / | 10.0 | / | 10.0 | 10.0 | 9.9 | 9.8 | 10.0 | 10.0 | | | |
| pH | / | 7.5 | / | 7.5 | / | 7.5 | 7.6 | 7.6 | 7.6 | 7.6 | 7.5 | | | |
| Cond. (µS/cm) | | 333 | | 333 | | 330 | | 333 | | 333 | | | | |
| Initials | | CMB/BSL | | CMB/BSL | | BSL | | BSL/BSL | | BSL/BSL | | | | |

BSL Hatch Day 9

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | / | | | | | | | | | | | | | |
| DO (mg/L) | / | | | | | | | | | | | | | |
| pH | / | | | | | | | | | | | | | |
| Cond. (µS/cm) | / | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | / | | | | | | | | | | | | | |
| DO (mg/L) | / | | | | | | | | | | | | | |
| pH | / | | | | | | | | | | | | | |
| Cond. (µS/cm) | / | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: CMB, BSL, PWD

Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Match.

Client: Tack Corp
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 15/2019
 Stop Date & Time: June 5/2019
 Test Species: Oncorhynchus mykiss
Redside Shiner

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|------|-----|---------|------|---------|------|-------|------|-------|------|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | / | | | 10.0 | / | 10.2 | 10.2 | 10.2 | 10.1 | 10.0 | 9.9 | 10.0 | 9.9 |
| pH | / | | | 7.6 | / | 7.4 | 7.6 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | | | 333 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | | | BSL | | KSL/BSL | | KSL/BSL | | M/BSL | | M/BSL | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-------|------|------|------|------|------|------|------|-------|------|-------|------|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | / | 10.0 | 9.9 | 10.1 | 10.0 | 10.2 | 10.3 | 10.1 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 |
| pH | / | 7.5 | 7.7 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.3 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 333 | | 324 | | 322 | | 332 | | 333 | | 333 | |
| Initials | | M/BSL | | BSL | | KSL | | KSL | | M/BSL | | M/BSL | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: CMO BSL KSL AND

Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch

Start Date & Time: May 15/2019 @ 2030
 Stop Date & Time: May 16/2019 @ 0600
 Test Species: Roadside snail

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|----|--|----|--|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| ERIMP-04 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.1 | 9.9 | 10.2 | 10.0 | 10.2 | 9.9 | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | | | | | | | |
| Initials | | BR | | BR | | CMF | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|----|--|----|--|----|--|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| STPD-61 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.1 | 9.8 | 10.2 | 10.1 | | | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | | | | | | | |
| Initials | | BR | | BR | | CMF | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/AWD/CMF
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019/12/18

* mg/L as CaCO3

Sample Description: _____
 Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal

Sample ID: N/A Box Field Fertilized

Work Order #: N/A

Start Date & Time: May 15/19 @ 2030

Stop Date & Time: June 5/2019

Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|-----|----|----|----|-----|----|-----|-----|-----|----|-----|---------------------------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ERIMF1 | 1 | 0 | 0 | 52 | 52 | | | | | | | | | not viable |
| ERIMF2 | 2 | 0 | 0 | 16 | 16 | | | | | | | | | not viable |
| ERIMF3 | 3 | 0 | 0 | 65 | 65 | | | | | | | | | not viable |
| ERIMF4 | 4 | 0 | 0 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 Fert 82 unfert |
| STPD01 | 1 | 0 | 0 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 196 Fert 126 unfert |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| ERIMF4B | 1 | / | / | 0 | 0 | 0 | 80 | 0 | 1 | 0 | 0 | 0 | 0 | |
| ERIMF4C | 2 | / | / | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 1 | 0 | |
| STPD01B | 3 | / | / | 1 | 1 | 1 | 8 | 1 | 0 | 0 | 0 | 1 | 1 | |
| STPD01C | 4 | / | / | 1 | 1 | 1 | 7 | 0 | 0 | 1 | 0 | 0 | 1 | # hatchlings - some dead |
| STPD01D | 1 | / | / | 1 | 1 | 1 | 9 | 1 | 0 | 0 | 0 | 1 | 1 | |
| STPD01E | 2 | / | / | 1 | 1 | 1 | 9 | 1 | 0 | 0 | 0 | 1 | 1 | |
| | 3 | | | | | | | | | | | | | |
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| | 4 | | | | | | | | | | | | | |
| Tech Initials | | CMP | BFL | A | a | mm | CMP | a | CMP | CMP | BFL | a | CMP | |

Comments:

① Unfertilized/unviable ② 1 Hatchling ③ 2 Hatchlings # 5 w/ opaque/white yolk sac; blood flowing but slow

Reviewed by: _____

Date reviewed: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: BC RSC Field Fertilized N/A Start Date & Time: May 15/19 @ 2030
 Work Order #: N/A Stop Date & Time: June 5/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ERTMF 4B | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| ERTMF 4C | 2 | | | | | | | | | | | | | |
| STPD01B | 3 | | | | | | | | | | | | | |
| STPD01C | 4 | | | | | | | | | | | | | |
| STPD01D | 1 | | | | | | | | | | | | | |
| STPD01E | 2 | | | | | | | | | | | | | |
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| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | AW | BS | WV | WV | AS | WV | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/18
Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

^{BF}
 Start Date & Time: May 15/2009
 Stop Date: June 5/2009
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|---|---|-----|-----|-----|-----|-----|----|-----|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ERIMF-04B | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | |
| 04C | - | - | - | - | - | - | 0 | 0 | 0 | 0 | ↓ | ↓ | |
| STPD01-B | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | |
| ↓ 01-C | - | - | - | - | - | - | 0 | 0 | 2 | 1 | ↓ | ↓ | |
| ↓ 01-D | - | - | - | - | - | - | 0 | 0 | 0 | 0 | ↓ | ↓ | |
| ↓ 01-E | - | - | - | - | - | - | 0 | 0 | 1 | 0 | ↓ | ↓ | |
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| Tech Initials | OMP | BF | a | m | OMP | OMP | OMP | OMP | BRL | m | OMP | | |

Comments: _____

SS
201912118

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 15/19
 Stop Date: June 5/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|-----|-----|-----|------------------|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ERIMF-04B | 0 | 2 | 8 | 2 | _____ | | | | | | | | |
| 04C | 0 | 3 | 42 | 0 | _____ | | | | | | | | |
| STPP-01-B | 0 | 3 | 34 | 2 | _____ | | | | | | | | |
| 01-C | 0 | 34 | 0 | 40 | _____ | | | | | | | | |
| 01-D | 0 | 3 | 34 | 5 | _____ | | | | | | | | |
| 01-E | 0 | 6 | 33 | 0 | _____ | | | | | | | | |
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| Tech Initials | OMP | BSL | KSL | KSL | _____ | | | | | | | | |

Comments: (i) 3 are deformed (skeletal, craniofacial)

SS
2019112118

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{8P} May 15/2019
 Stop Date: June 1/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|----|---|---|---|-----|---|-----|-----|----|----|-----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ERIM-01B | - | - | - | - | - | - | - | - | - | - | - | - | |
| -04C | - | - | - | - | - | - | 0 | 0 | 0 | 0 | 0 | 0 | |
| STPD-01-B | - | - | - | - | - | - | - | - | - | - | - | - | |
| 01-C | - | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | |
| 01-D | - | - | - | - | - | - | - | - | - | - | - | - | |
| 01-E | - | - | - | - | - | - | - | - | 0 | 0 | 0 | 0 | |
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| Tech Initials | CMP | SP | A | R | W | CMP | A | CMP | CMP | BL | A | CMP | |

Comments: _____

SS
2019/12/18

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

SR
 Start Date & Time: May 15/2019
 Stop Date: Jun 27/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|-------------|--|-----|----|----|-----|-----|-----|-----|-----|-----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ERD-01B | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 04C | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| STPD-01-B | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 01-C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | | | | |
| 01-D | - | - | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| 01-E | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
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| Tech Inials | CAF | BPL | KJ | KJ | BPL | BPL | BPL | BPL | BPL | BPL | | | |

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 18/19
 Stop Date & Time: June 7/2019
 Test Species: Redside shiner

| LNK-11 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 10.5 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.0 | 9.9 | 10.2 | 10.1 | 10.2 | 9.9 | 10.1 | 9.8 | 10.2 | 9.8 | 10.3 | 10.0 |
| pH | / | 7.6 | 7.3 | 7.5 | 7.4 | 7.7 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 |
| Cond. (µS/cm) | / | 340 | | 338 | | 341 | | 337 | | 339 | | 338 | |
| Initials | JEC | r | | w | | CMP | | r | | CMP | | CMP | |

| LNK-12 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 10.5 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.0 | 10.0 | 10.2 | 10.2 | 10.2 | 9.8 | 10.1 | 10.0 | 10.2 | 9.9 | 10.3 | 10.1 |
| pH | / | 7.6 | 7.4 | 7.5 | 7.4 | 7.7 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | / | 340 | | 338 | | 341 | | 337 | | 339 | | 338 | |
| Initials | JEC | r | | w | | CMP | | r | | CMP | | CMP | |

| LNK-13 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 10.5 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | / | 10.0 | 10.0 | 10.2 | 10.2 | 10.2 | 10.0 | 10.1 | 9.8 | 10.2 | 10.0 | 10.3 | 10.0 |
| pH | / | 7.6 | 7.4 | 7.5 | 7.5 | 7.7 | 7.5 | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.4 |
| Cond. (µS/cm) | / | 340 | | 338 | | 341 | | 337 | | 339 | | 338 | |
| Initials | JEC | r | | w | | CMP | | r | | CMP | | CMP | |

| ERMF-05 Concentration | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 10.5 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | / | 10.0 | 10.0 | 10.2 | 10.3 | 10.2 | 9.9 | 10.1 | 9.8 | 10.2 | 9.9 | 10.3 | 10.1 |
| pH | / | 7.6 | 7.4 | 7.5 | 7.4 | 7.7 | 7.5 | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | / | 340 | | 338 | | 341 | | 337 | | 339 | | 338 | |
| Initials | JEC | r | | w | | CMP | | r | | CMP | | CMP | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Analysts: BAL/ALD/CMP
YVL/KJL/SS
 Reviewed by: SS
 Date reviewed: 20191121

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal Embryo Start Date & Time: May 18/19
 Sample ID: N/A Stop Date & Time: June 7/2019
 Work Order #: N/A Test Species: Redside shiner

| LNK-11 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | | 10.3 | 10.0 | 9.9 | 9.9 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.3 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.4 | 7.6 |
| Cond. (µS/cm) | | 335 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | | BSL | | r | | CML | | CML | | WYBSL | | KJL | |

| LNK-12 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.2 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.6 |
| Cond. (µS/cm) | | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | | BSL | | r | | CML | | CML | | WYBSL | | KJL | |

| LNK-13 Concentration | Days | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | | 10.3 | 10.1 | 9.9 | 9.9 | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.2 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 |
| Cond. (µS/cm) | | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | | BSL | | r | | CML | | CML | | WYBSL | | KJL | |

| ERMF-05 Concentration | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.2 |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.6 |
| Cond. (µS/cm) | | 336 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | | BSL | | r | | CML | | CML | | WYBSL | | KJL | |

Thermometer: T-9 DO meter: DD-3 pH meter: PH-3 Conductivity meter: CO-D-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/ALD/CHP
RYL/KJL
 Reviewed by: SS
 Date reviewed: 2019112118

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: ToxCo
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 18/2019
 Stop Date & Time: June 7/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|---------|------|---------|------|------|------|------|------|---------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| LNLK-11 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 | 9.9 | | |
| pH | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | | |
| Cond. (µS/cm) | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | | |
| Initials | KSL/BSL | | AWD/BSL | | AWD/BSL | | BSL | | BSL | | CMP/BSL | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|---------|------|---------|------|------|------|------|------|---------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| LNLK-12 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 | | |
| DO (mg/L) | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.1 | | |
| pH | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | | |
| Cond. (µS/cm) | 332 | | 333 | | 333 | | 332 | | 333 | | 335 | | | |
| Initials | KSL/BSL | | AWD/BSL | | AWD/BSL | | BSL | | BSL | | CMP/BSL | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|---------|------|---------|------|------|------|------|------|---------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| LNLK-13 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 | | |
| DO (mg/L) | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.1 | | |
| pH | 7.3 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | | |
| Cond. (µS/cm) | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | | |
| Initials | KSL/BSL | | AWD/BSL | | AWD/BSL | | BSL | | BSL | | CMP/BSL | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|---------|------|---------|------|------|------|------|------|---------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ERIM-05 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | | |
| DO (mg/L) | 10.2 | 10.1 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | | |
| pH | 7.4 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | |
| Cond. (µS/cm) | 332 | | 333 | | 333 | | 332 | | 333 | | 336 | | | |
| Initials | KSL/BSL | | AWD/BSL | | AWD/BSL | | BSL | | BSL | | CMP/BSL | | | |

DO meter: D-3 pH meter: pH-7 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: KSL BSL AWD
CMP
 Reviewed by: SS
 Date reviewed: 2019/12/15

* mg/L as CaCO₃

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tuck Coal Hazen Start Date & Time: May 18/2019
 Sample ID: N/A Stop Date & Time: June 7/2019
 Work Order #: N/A Test Species: Oncorhynchus mykiss
RiverSide Shrimp

| Concentration LNLK-11 | Days | | | | | | | | | | | | |
|---------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 12 | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 | 9.9 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.4 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | | KJL | | A | | A | | BRL | | BRL | | CMP | |

| Concentration LNLK-12 | Days | | | | | | | | | | | | |
|---------------------------------|---------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 12 | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | 10.3 | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.1 |
| pH | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | 332 | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | KJL/BRL | KJL | | A | | A | | BRL | | BRL | | CMP | |

| Concentration LNLK-13 | Days | | | | | | | | | | | | |
|---------------------------------|---------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 12 | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | 10.3 | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.1 |
| pH | 7.4 | 7.3 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | 332 | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | KJL/BRL | KJL | | A | | A | | BRL | | BRL | | CMP | |

| Concentration ERIMF-05 | Days | | | | | | | | | | | | |
|----------------------------------|---------|------|------|------|------|------|------|------|------|------|------|---------|------|
| | 12 | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | 10.3 | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 |
| pH | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | 332 | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | KJL/BRL | KJL | | A | | A | | BRL | | BRL | | CMP/BRL | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cont-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BPL/AWD/CMP

YJL/KJL

Reviewed by: SS

Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 18/2019
 Stop Date & Time: June 7/2019
 Test Species: Redside shiner

| Hatch Concentration LNLK-11 | Days | | | | | | | | | | | | | |
|--------------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 13.5 | | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | | 10.0 | | | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.6 | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | 335 | | | | | | | | | | |
| Initials | | BR | | BR | | | | | | | | | | |

| Concentration LNLK-17 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 13.5 | | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | | 9.9 | | | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.6 | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | 335 | | | | | | | | | | |
| Initials | | BR | | BR | | | | | | | | | | |

| Concentration LNLK-13 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.8 | | 9.9 | | | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.6 | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | 335 | | | | | | | | | | |
| Initials | | BR | | BR | | | | | | | | | | |

| Concentration ERINF-05 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | | 10.0 | | | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.6 | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | 335 | | | | | | | | | | |
| Initials | | BR | | BR | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BPL/ADD/CMR
YKL/KJL
 Reviewed by: SS
 Date reviewed: 2019112118

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{EST} May 18/19
 Stop Date & Time: June 7/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | | | | | | |
|---------------|-----|----------------------------------|-----|--------|-----|-----|-----|-----|---|-----|-----|----|----|---------------------------------|--|--|--|--|--|--|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | | | | | |
| LNLK-11 | 1 | 0 | 0 | 204/31 | / | | | | | | | | | | | | | | | |
| LNLK-12 | 2 | 1 | 1 | 87/35 | | | | | | | | | | | | | | | | |
| LNLK-13 | 3 | 1 | 1 | 248/42 | | | | | | | | | 0 | | | | | | | |
| ERIMF-05 | 4 | 1 | 1 | 173/21 | | | | | | | | | 2 | | | | | | | |
| | 1 | | | | B/L | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | | | |
| LNLK-11 B | 1 | / | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | |
| C | 2 | | | | 1 | 0 | | | | | | | | | | | | | | |
| D | 3 | | | | 1 | 0 | | | | | | | | | | | | | | |
| E | 4 | | | | 1 | 0 | | | | | | | | | | | | | | |
| F | 1 | | | | 1 | 0 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | |
| LNLK-12 B | 3 | / | | | 0 | 1 | | | | | | | | | | | | | | |
| C | 4 | | | | 1 | 0 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | | | |
| LNLK-13 B | 2 | | | | / | | | 0 | 0 | | | | | | | | | | | |
| C | 3 | | | | | | | 1 | 0 | | | | | | | | | | | |
| D | 4 | | | | | | | 1 | 0 | | | | | | | | | | | |
| E | 1 | 1 | 0 | | | | | | | | | | | | | | | | | |
| F | 2 | 1 | 1 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | | | |
| ERIMF-05B | 4 | / | | | 0 | 1 | | | | | | | | | | | | | | |
| C | 1 | | | | 1 | 0 | | | | | | | | | | | | | | |
| D | 2 | | | | 1 | 0 | | | | | | | | | | | | | | |
| E | 3 | | | | 1 | 0 | | | | | | | | | | | | | | |
| | 4 | | | | 1 | 0 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | | | |
| Tech Initials | | AND | H/L | B/L | A | CMP | CMP | B/L | A | CMP | CMP | IM | EV | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/19

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BPL} May 19/2019
 Stop Date & Time: June 7/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|-----|----|----|-----|-----|-----|----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| LNLK-11 | B | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | | | | | |
| | C | 2 | | | | | 0 | 0 | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| | F | 1 | | | | | | 0 | | | | | | |
| | | 2 | | | | | | | | | | | | |
| LNLK-12 | B | 3 | | | | | 3 | | | | | | | |
| | C | 4 | | | | | 0 | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| LNLK-13 | B | 2 | | | | | | | | | | | | |
| | C | 3 | | | | | | | | | | | | |
| | D | 4 | | | | | | | | | | | | |
| | E | 1 | | | | | | | | | | | | |
| | F | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| ERIMP-05B | | 4 | | | | | | | | | | | | |
| | C | 1 | | | | | | | | | | | | |
| | D | 2 | | | | | | | | | | | | |
| | E | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| Tech Initials | | | KDL | | A | BPL | BPL | BPL | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 20191121Z
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{at} May 18 / 2019
 Stop Date: June 7 / 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments | |
|-------------------------|----------------------------|-----|-----|---|-------|-------|-----|---|-------|-------|----|-----|----------|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| LNLK-11 B | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| D | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| E | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| F | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| LNLK-12 B | - | - | - | - | - | - | - | - | - | - | - | 7 | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | 2 | - | |
| LNLK-13 B | - | - | - | - | - | - | - | - | - | - | - | 1 | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | 10 | - | |
| ^{SP} LNLK D | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| E | - | - | - | - | - | - | - | - | - | - | - | 12 | - | |
| F | - | - | - | - | - | - | - | - | - | - | - | 1 | - | |
| ER INF-05 A | - | - | - | - | - | - | - | - | - | - | - | 3 | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | 8 | - | |
| D | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| E | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| Tech Initials | A.P | Y.L | B.R | A | C.M.P | C.M.P | B.R | A | C.M.P | C.M.P | M | K.L | | |

Comments: _____

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

55
 Start Date & Time: May 18/2019
 Stop Date: June 7/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|-----------------|-----|-----|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| LNLK-11 B | 19 | - | - | 18 | 9 | | | | | | | | |
| C | 11 | - | - | 19 | 22 | | | | | | | | |
| D | 7 | - | - | 35 | 6 | | | | | | | | |
| E | - | - | - | 46 | 3 | | | | | | | | |
| F | - | - | - | 10 | 6 | | | | | | | | extra |
| LNLK-12 B | 30 | - | - | 8 | 1 | | | | | | | | |
| C | 23 | 7 | | | | | | | | | | | |
| LNLK-13 B | 31 | - | - | 10 | 3 | | | | | | | | |
| C | - | - | - | 30 | 11 | | | | | | | | |
| D | - | - | - | 32 | | | | | | | | | |
| E | 16 | - | - | 6 | 15 | | | | | | | | |
| F | 4 | - | - | 14 | | | | | | | | | |
| ERIM705 B | 2 | 8 | - | 36 | | | | | | | | | |
| C | 20 | - | - ⁵⁵ | 365 | | | | | | | | | |
| D | - | - | - ⁵⁵ | 346 | 4 | | | | | | | | |
| E | 2 | 0 | 21 | | | | | | | | | | |
| Tech Initials | KSL | ~ | ~ | BRL | BRL | | | | | | | | |

Comments:

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: NA

Start Date & Time: ^{5:00} May 18 / 2019
 Stop Date: Jun 7 / 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | |
|---------------|--|-----|----|---|-----|-----|----|---|-----|-----|----|-----|----------|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| LNLK-11 B | ✓ | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | |
| LNLK-12 B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| LNLK-13 B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | |
| BRM-05 B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | |
| Tech Initials | ✓ | YYL | BR | ✓ | CHP | CHP | BR | ✓ | CHP | CHP | N | KJL | | |

Comments: _____

SS
 2019/12/18

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{5:00} May 18/2019
 Stop Date: June 7/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | |
|---------------|--|----|----|----|----|----|----|----|----|----|----|----|----------|--|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | |
| LNLK-11 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| C | | | | | | 0 | | | | | | | | |
| D | | | | | | 0 | | | | | | | | |
| E | | | | | | 0 | | | | | | | | |
| F | | | | | | | | | | | | | | |
| LNLK-12 B | | | | | | | | 1 | | | | | | |
| C | | | | | | | | 0 | | | | | | |
| LNLK-13 B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | |
| ERTMFO-B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | |
| E | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | | |
| Tech Initials | KSL | M | N | BL | BL | BL | BL | BL | BL | | | | | |

Comments: _____

SS
 2019/12/18

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teays Coal.
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 26/19
 Stop Date & Time: July 10/19
 Test Species: Redside shiner

| Concentration <u>LWL-4</u> | Days | | | | | | | | | | | | |
|-------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.6 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.8 | 10.2 | 9.9 | 10.3 | 10.0 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 |
| pH | / | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | / | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | JRE | JRE | | CMP | | CMP | | BPL | | A | | CMP | |

| Concentration <u>LWL-5</u> | Days | | | | | | | | | | | | |
|-------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.7 | 10.2 | 9.9 | 10.3 | 10.0 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 |
| pH | / | 7.5 | 7.0 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 |
| Cond. (µS/cm) | / | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | JRE | JRE | | CMP | | CMP | | BPL | | A | | CMP | |

| Concentration <u>LWL-13</u> | Days | | | | | | | | | | | | |
|--------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.8 | 10.2 | 10.0 | 10.3 | 10.1 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 9.9 |
| pH | / | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | / | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | JRE | A | | CMP | | CMP | | BPL | | A | | CMP | |

| Concentration <u>LWL-12</u> | Days | | | | | | | | | | | | |
|--------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.6 | 10.2 | 9.9 | 10.3 | 10.1 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 |
| pH | / | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | / | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | JRE | A | | CMP | | CMP | | BPL | | A | | CMP | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/AWD/CMP/YYL/KJS
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teek Coal Embryo
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/19
 Stop Date & Time: June 10/2019
 Test Species: Redside shiner

| LNLE 18 Concentration | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.9 | 10.2 | 10.0 | 10.3 | 10.1 | 10.3 | 10.1 | 9.9 | 9.9 | 10.1 | 9.9 |
| pH | / | 7.5 | 7.4 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | see | A | | CML | | CML | | BSC | | A | | CML | |

| LNLE 19 Concentration | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 9.8 | 9.8 | 10.2 | 10.0 | 10.3 | 10.2 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 |
| pH | / | 7.5 | 7.4 | 7.6 | 7.4 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | see | A | | CML | | CML | | BSC | | A | | CML | |

| LNLE 20 Concentration | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 9.8 | 9.8 | 10.2 | 9.9 | 10.3 | 10.1 | 10.3 | 10.0 | 9.9 | 9.9 | 10.1 | 10.0 |
| pH | / | 7.5 | 7.5 | 7.6 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | see | A | | CML | | CML | | BSC | | A | | CML | |

| ERIME-02 Concentration | Days | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | / | 10.1 | 9.9 | 10.2 | 10.0 | 10.3 | 10.2 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.1 |
| pH | / | 7.5 | 7.5 | 7.6 | 7.4 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 338 | | 338 | | 336 | |
| Initials | see | A | | CML | | CML | | BSC | | A | | CML | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3
BPL TEMP/AVIS/ML/KSL
 Analysts: _____
 Reviewed by: SS
 Date reviewed: 2019/12/19

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teek Coal Embryo
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/19
 Stop Date & Time: June 10/19
 Test Species: Oncorhynchus mykiss

| Concentration | Days | | | | | | | | | | | | |
|------------------|-----------------|------|------|--------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| LNLK-14 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 10.1 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CMP | | UM/BSC | | KJL | | KJL | | A | | A | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-----------------|------|------|--------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| LNLK-15 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.2 | 10.0 | 9.9 | 10.0 | 10.2 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CMP | | UM/BSC | | KJL | | KJL | | A | | A | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-----------------|------|------|--------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| LNLK-16 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.2 | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.2 |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.5 | 7.6 | 7.4 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CMP | | UM/BSC | | KJL | | KJL | | A | | A | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|--------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| LNLK-17 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.3 | 10.1 | 10.2 | 10.0 | 10.0 | 10.0 | 10.1 |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CMP | | UM/BSC | | KJL | | KJL | | A | | A | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | | | | |
|-------------|--|--|--|--|
| Control | | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/ALD/CMP/YL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 21/19
 Stop Date & Time: June 10/2019
 Test Species: Oncorhynchus mykiss

| Concentration LNLK-18 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|---------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 9.9 | 10.1 | 9.9 | 10.3 | 10.2 | 10.1 | 10.3 | 10.0 | 9.9 | 10.0 | 10.1 |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.5 | 7.6 | 7.6 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CML | | WML/BRL | | KJL | | KJL | | A | | A | |

| Concentration LNLK-19 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|---------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 9.8 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.2 | 9.9 | 9.8 | 10.0 | 10.0 |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.3 | 7.3 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CML | | WML/BRL | | KJL | | KJL | | A | | A | |

| Concentration LNLK-20 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|---------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 9.9 | 10.1 | 10.1 | 10.3 | 10.1 | 10.1 | 10.3 | 10.0 | 9.9 | 10.0 | 10.1 |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.4 | 7.6 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CML | | WML/BRL | | KJL | | KJL | | A | | A | |

| Concentration ERIMF-06 | Days | | | | | | | | | | | | |
|---------------------------|-------|------|------|---------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.0 | 9.9 | 10.1 | 10.1 | 10.3 | 10.0 | 10.1 | 10.3 | 10.0 | 9.9 | 10.0 | 10.0 |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.4 | 7.6 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 |
| Cond. (µS/cm) | | 339 | | 334 | | 332 | | 332 | | 333 | | 333 | |
| Initials | | CML | | WML/BRL | | KJL | | KJL | | A | | A | |

Thermometer: T-1 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3
 Analysts: BAL/AWD/UMP/YML/EJL

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Reviewed by: SS
 Date reviewed: 2019/11/29

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Client: Tests Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 21 / 2019
 Stop Date & Time: June 10 / 2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.0 | 9.9 | 10.2 | 9.8 | 10.0 | 10.0 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 338 | | 336 | | | | | | |
| Initials | | BPL | | BPL | | CML | | BPL | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 | 10.0 | 10.0 | 10.0 | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 337 | | 333 | | 338 | | 336 | | | | | | |
| Initials | | BPL | | BPL | | CML | | BPL | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 | 10.0 | 10.0 | 10.0 | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 338 | | 336 | | | | | | |
| Initials | | BPL | | BPL | | CML | | BPL | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.8 | 10.2 | 10.1 | 10.0 | 10.1 | | | | | |
| pH | | 7.5 | 7.0 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 338 | | 336 | | | | | | |
| Initials | | BPL | | BPL | | CML | | BPL | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BPL/AND/COMP/YXL/KJL
 Reviewed by: SS
 Date reviewed: 2019/11/29

| Control | | | |
|-------------|--|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO₃

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Tech Coal Embryo Start Date & Time: May 21/2019
 Sample ID: N/A Stop Date & Time: June 10/2019
 Work Order #: N/A Test Species: Redside skiners

| Concentration LNK-18 | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 9.9 | 10.0 | 10.1 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 336 | | | | | | |
| Initials | | BR | | BR | | CML | | /BR | | | | | | |

| Concentration LNK-19 | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|-------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | | | | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.2 | 9.9 | 10.0 | 9.9 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | / 336 | | | | | | |
| Initials | | BR | | BR | | CML | | / BR | | | | | | |

| Concentration LNK-20 | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|------|------|------|------|------|-------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | | | | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.0 | 10.0 | 10.2 | 10.1 | 10.0 | 9.9 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | / 336 | | | | | | |
| Initials | | BR | | BR | | CML | | / BR | | | | | | |

| ERINF-06 Concentration LNK-21 | Days | | | | | | | | | | | | | |
|--|-------|------|------|------|------|------|------|-------|------|-----|-----|-----|-----|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | | | | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | 10.0 | 10.0 | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | | | | | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | / 336 | | | | | | |
| Initials | | BR | | BR | | CML | | / BR | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | | | | | |
|-------------|---------|--|--|--|--|
| | Control | | | | |
| Hardness* | / | | | | |
| Alkalinity* | / | | | | |

Analysts: BPL/AND/CMP/YL/KJL
 Reviewed by: SS
 Date reviewed: 2019/11/29

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/2019
 Stop Date & Time: June 10/2019
 Test Species: Redside Shiner

| Concentration LNK-14 | Days | | | | | | | | | | | | | |
|-------------------------|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | 10.0 | / | 10.2 | 9.9 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | |
| pH | | | | 7.5 | / | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | | | 333 | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | | | BS | | BS | | BS | | BS | | BS | | |

| Concentration LNK-15 | Days | | | | | | | | | | | | | |
|-------------------------|-------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | / | 10.0 | 9.9 | 10.2 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | |
| pH | | 7.5 | / | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | |
| Cond. (µS/cm) | | 333 | | 333 | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | BS | | BS | | BS | | BS | | BS | | BS | | |

Hatch

| Concentration LNK-16 | Days | | | | | | | | | | | | | |
|-------------------------|-------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | / | | / | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | / | | / | 10.2 | / | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| pH | | | / | | / | 7.5 | / | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | |
| Cond. (µS/cm) | | | / | | / | 336 | / | 336 | | 340 | | 337 | | |
| Initials | | | / | | / | BS | / | BS | | BS | | BS | | |

| Concentration LNK-17 | Days | | | | | | | | | | | | | |
|-------------------------|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-----|
| | init. | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | 10.0 | / | 10.2 | 9.8 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | |
| pH | | | | 7.5 | / | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | |
| Cond. (µS/cm) | | | | 333 | | 336 | | 336 | | 340 | | 337 | | |
| Initials | | | | BS | | BS | | BS | | BS | | BS | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | / | | |
| Alkalinity* | / | | |

Analysts: BPL/AED/AMP/HK/KSL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Hatch

Client: Jack Coal
 Sample ID: NA
 Work Order #: 21A

Start Date & Time: May 21/2019
 Stop Date & Time: June 10/2019
 Test Species: Redside darter

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-----|
| | 13 | | | 14 | | 15 | | 16 | | 17 | | 18 | | |
| LNK-18 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | 10.0 | | 10.2 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | |
| pH | | | | 7.5 | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | |
| Cond. (µS/cm) | | | | 333 | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | | | BR | | BR | | BR | | BR | | BR | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | | 14 | | 15 | | 16 | | 17 | | 18 | | |
| LNK-19 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | | 10.0 | 9.9 | 10.2 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | |
| pH | | 7.5 | | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | |
| Cond. (µS/cm) | | 333 | | 333 | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | BR | | BR | | BR | | BR | | BR | | BR | | |

Hatch

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | | 14 | | 15 | | 16 | | 17 | | 18 | | |
| LNK-20 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | | 10.0 | 9.7 | 10.2 | 10.0 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 9.9 | |
| pH | | 7.5 | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | 333 | | 333 | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | BR | | BR | | BR | | BR | | BR | | BR | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | 13 | | | 14 | | 15 | | 16 | | 17 | | 18 | | |
| ERSMF-06 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.2 | | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 9.9 | |
| pH | | | | | | 7.5 | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | | | | | 338 | | 336 | | 340 | | 337 | | |
| Initials | | | | | | BR | | BR | | BR | | BR | | |

DO meter: DO-3

pH meter: pH-3

Conductivity meter: COND-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: MAF AND JMD / YK / HSL

Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Teck coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21 / 2019
 Stop Date & Time: June 10 / 2019
 Test Species: Redside shiner

| Concentration LNK-14 | Days | | | | | | | | | | | | | |
|-------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | / | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | / | 10.0 | | | | | | | | | |
| pH | | 7.7 | 7.7 | / | 7.8 | | | | | | | | | |
| Cond. (µS/cm) | | 339 | | 339 | | | | | | | | | | |
| Initials | | CML | | BCL | | | | | | | | | | |

| Concentration LNK-15 | Days | | | | | | | | | | | | | |
|-------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | / | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | / | 9.9 | | | | | | | | | |
| pH | | 7.7 | 7.8 | / | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 339 | | 339 | | | | | | | | | | |
| Initials | | CML | | BCL | | | | | | | | | | |

| Concentration LNK-16 | Days | | | | | | | | | | | | | |
|-------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | / | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | / | 9.9 | | | | | | | | | |
| pH | | 7.7 | 7.7 | / | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 339 | | 339 | | | | | | | | | | |
| Initials | | CML | | BCL | | | | | | | | | | |

| Concentration LNK-17 | Days | | | | | | | | | | | | | |
|-------------------------|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | | 21 | | 22 | | 23 | | 24 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | / | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | / | 10.0 | | | | | | | | | |
| pH | | 7.7 | 7.7 | / | 7.8 | | | | | | | | | |
| Cond. (µS/cm) | | 339 | | 339 | | | | | | | | | | |
| Initials | | CML | | BCL | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/AND/comp/ML/KFL

Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Embryo ^{BSP}

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/19
 Stop Date & Time: June 10/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead | |
|---------------|-----|----------------------------------|-----|-----|-----|---|-----|-----|----|---|----|----|----|--------------------------|---------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Eggs/Embryos/ Alevins | Fert + Unfert |
| LNLK-14 | 1 | 0 | 0 | 267 | | | | | | | | | | 153 | |
| -15 | 2 | | 1 | 214 | | | | | | | | | | 163 | |
| -16 | 3 | | | 231 | | | | | | | | | | 38 | 8 |
| -17 | 4 | | | 125 | | | | | | | | | | 81 | |
| -18 | 1 | | | 155 | | | | | | | | | | 11 | 2 |
| -19 | 2 | | | 232 | | | | | | | | | | 189 | 1 |
| -20 | 3 | | | 167 | | | | | | | | | | 60 | |
| ERIMF-20 | 4 | | | 52 | | | | | | | | | | 8 | 3 |
| LNLK-14B | 1 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 14C | 2 | | | | | | | | | | | | | | |
| 14D | 3 | | | | | | | | | | | | | | |
| 14E | 4 | | | | | | | | | | | | | | |
| 15B | 1 | | | | | | | | | | | | | | |
| 15C | 2 | | | | | | | | | | | | | | |
| 15D | 3 | | | | | | | | | | | | | | |
| 15E | 4 | | | | | | | | | | | | | | |
| 16-B | 1 | | | | | | | | | | | | | | |
| 17-B | 2 | | | | | | | | | | | | | | |
| 17-C | 3 | | | | | | | | | | | | | | |
| 18-B | 4 | | | | | | | | | | | | | | |
| 19-B | 1 | | | | | | | | | | | | | | |
| 19-C | 2 | | | | | | | | | | | | | | |
| 19-D | 3 | | | | | | | | | | | | | | |
| 19-E | 4 | | | | | | | | | | | | | | |
| 20-B | 1 | | | | | | | | | | | | | | |
| 20-C | 2 | | | | | | | | | | | | | | |
| ERIMF-06-B | 3 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| Tech Initials | | R | CMP | CMP | BRL | ✓ | BRL | CMP | Un | ✓ | ✓ | ✓ | ✓ | | |

Comments: _____

Reviewed by: SS Date reviewed: 201911129

Embryo-Alevin Toxicity Test Daily Mortality

Embryo SM

Client: Tracy Coal
 Sample ID: N/A
 Work Order #: MIA

Start Date & Time: May 21/2019
 Stop Date & Time: June 10/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|----|----|----|----|----|----|----|----|----|----|---------------------------------|----|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 24 |
| LNLK-14 B | 1 | 0 | 0 | 0 | | | | | | | | | | |
| | C | | | | | | | | | | | | | |
| | D | | | | 1 | | | | | | | | | |
| | E | | | | | | | | | | | | | |
| LNLK-15 B | 1 | | | | | | | | | | | | | |
| | C | | | 1 | | | | | | | | | | |
| | D | | 1 | 1 | | | | | | | | | | |
| | E | | 1 | 0 | | | | | | | | | | |
| LNLK 16 B | 1 | | 12 | 29 | | | | | | | | | | |
| LNLK 17 B | 2 | | 0 | 0 | | | | | | | | | | |
| | C | | | | | | | | | | | | | |
| LNLK 18 B | 4 | | | | | | | | | | | | | |
| LNLK 19 B | 1 | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | |
| LNLK-20 B | 1 | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | |
| ERIM-06 B | 3 | | | | | | | | | | | | | |
| | 4 | ✓ | ↓ | ↓ | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BP | BP | BP | BP | | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/11/29
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21st / 2019
 Stop Date: June 10 / 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|---|---|---|---|---|---|---|---|----------------|----|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ERIMF-06B | 4 ^② | | | | | | | | | 4 ^② | 0 | 0 | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| Tech Initials | _____ | | | | | | | | | KJL | ~ | ~ | |

Comments: ② very pale, underdeveloped

SS
 2019/11/29

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/2019
 Stop Date: Jun 10/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments | | |
|---------------|----------------------------|----|--------|-------|-------|----|----|----|----|----|----|----|----------|--|--|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | |
| LNLK-14 B | 0 | 44 | 4 | ~~~~~ | | | | | | | | | | | |
| C | | 47 | 3 | ~~~~~ | | | | | | | | | | | |
| D | | 47 | 1 | 0 | ~~~~~ | | | | | | | | | | |
| E | | - | 4 | ~~~~~ | | | | | | | | | | | |
| LNLK 5 B | | 44 | 7 | ~~~~~ | | | | | | | | | | | |
| C | ✓ | 33 | 17 | ~~~~~ | | | | | | | | | | | |
| D | 23 | 25 | | ~~~~~ | | | | | | | | | | | |
| E | 0 | 11 | 1 | ~~~~~ | | | | | | | | | | | |
| LNLK 16 B | | - | 8 | ~~~~~ | | | | | | | | | | | |
| LNLK 17 B | | 38 | 11 | ~~~~~ | | | | | | | | | | | |
| C | | 27 | 4 | ~~~~~ | | | | | | | | | | | |
| LNLK 18 B | ✓ | 8 | 3 | ~~~~~ | | | | | | | | | | | |
| LNLK 19 B | 4 | 46 | | ~~~~~ | | | | | | | | | | | |
| C | 0 | 45 | 3 | ~~~~~ | | | | | | | | | | | |
| D | 0 | 34 | 14 | ~~~~~ | | | | | | | | | | | |
| E | 5 | 31 | 3 | ~~~~~ | | | | | | | | | | | |
| LNLK 20 B | ✓ | 16 | 3 | ~~~~~ | | | | | | | | | | | |
| C | | 9 | 1 | ~~~~~ | | | | | | | | | | | |
| ERDMF-02 B | ✓ | 0 | 3 | ~~~~~ | | | | | | | | | | | |
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| Tech Initials | BR | BR | BR/CRP | | | | | | | | | | | | |

Comments: _____

SS

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 21/2019
 Stop Date: June 10/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| LNLK-14 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | / |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| LNLK 15 B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| LNLK16 B | | | | | | 2 | | | | | | | |
| LNLK17 B | | | | | | 0 | | | | | | | |
| C | | | | | | | | | | | | | |
| LNLK18 B | | | | | | | | | | | | | |
| LNLK19 B | | | | | | 1 | | | | | | | |
| C | | | | | | 0 | XCD | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | 101 | | STH | | | | | |
| LNLK-20 B | | | | | | 0 | | 0 | | | | | |
| C | | | | | | | | 0 | | | | | |
| ERJMF-06G | ✓ | ✓ | ✓ | - | - | - | - | 0 | | | | | |
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| Tech Initials | BPL | BPL | BPL | BPL | BPL | BPL | CMP | BPL | | | | | |

Comments: Otolithian wood

SS
2019/11/29

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: NA
 Work Order #: N/A

Embryo
 Start Date & Time: May 24/19
 Stop Date & Time: June 13 2019
 Test Species: Redside shiner

~~BR~~ ~~ERICMF-6~~

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.0 | 9.9 | 9.9 | 10.1 | 10.1 | 10.0 | 9.9 | 10.1 | 10.0 | 10.3 | 10.2 | |
| pH | 7.7 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.4 | 7.6 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BSL | BSL | | A | | CML | | CML | | WV/BSL | | KL | | |

ERICMF-7

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 9.9 | 10.1 | 10.0 | 10.3 | 10.1 | |
| pH | 7.7 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BSL | BSL | | A | | CML | | CML | | WV/BSL | | KL | | |

ERICMF-8

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 9.9 | 10.0 | 10.0 | 10.1 | 10.0 | 10.3 | 10.1 | |
| pH | 7.7 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BSL | BSL | | A | | CML | | CML | | WV/BSL | | KL | | |

ERICMF-9

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.0 | 9.9 | 9.7 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.3 | 10.2 | |
| pH | 7.7 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BSL | BSL | | A | | CML | | CML | | WV/BSL | | KL | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/ALD/CMP
YYL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 24/19
 Stop Date & Time: June 13/20 19
 Test Species: Redside shiner

| ERIMF-10 Concentration | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.0 | 9.8 | 9.8 | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.2 | |
| pH | 7.8 | 7.8 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BPL | BPL | | r | | CML | | CML | | UW/BPL | | KJL | | |

| ERIMF-11 Concentration | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.7 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.2 | |
| pH | 7.8 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BPL | BPL | | r | | CML | | CML | | UW/BPL | | KJL | | |

| ERIMF-12 Concentration | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.9 | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.2 | |
| pH | 7.8 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BPL | BPL | | r | | CML | | CML | | UW/BPL | | KJL | | |

| ERIMF-13 Concentration | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|--------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.5 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.3 | 10.2 | |
| pH | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 335 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BPL | BPL | | r | | CML | | CML | | UW/BPL | | KJL | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/ALD/CML
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

* mg/L as CaCO3

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo
 Start Date & Time: May 24/19
 Stop Date & Time: June 13/2019
 Test Species: Redside shiner

| ERIMF-14 Concentration | Days | | | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|--------|------|------|------|------|--|
| | 0 | | 1 | | | 2 | | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | |
| pH | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | 338 | 338 | 338 | 336 | 336 | 339 | 339 | 339 | 334 | 334 | 332 | 332 | 332 | |
| Initials | BSL | BSL | | A | | CMF | | CMF | | CMF | ML/BSL | | BSL | | BSL | |

| ERIMF-15 Concentration | Days | | | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|--------|------|------|------|------|--|
| | 0 | | 1 | | | 2 | | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | |
| pH | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | 338 | 338 | 338 | 336 | 336 | 339 | 339 | 339 | 334 | 334 | 332 | 332 | 332 | |
| Initials | BSL | BSL | | A | | CMF | | CMF | | CMF | ML/BSL | | BSL | | BSL | |

| ERIMF-16 Concentration | Days | | | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|--------|------|------|------|------|--|
| | 0 | | 1 | | | 2 | | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 10.1 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 9.9 | 10.1 | 10.0 | 10.3 | 10.3 | 10.1 | 10.1 | |
| pH | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 332 | 338 | 338 | 338 | 338 | 336 | 336 | 339 | 339 | 339 | 334 | 334 | 332 | 332 | 332 | |
| Initials | BSL | BSL | | A | | CMF | | CMF | | CMF | ML/BSL | | BSL | | BSL | |

| Concentration | Days | | | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | | 2 | | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: D-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BPL/ALD/CMF
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

~~Hatch SR~~
Embryo SR

Start Date & Time: May 24 / 2019
 Stop Date & Time: June 13 / 2019
 Test Species: Oncorhynchus mykiss SR
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|--|--|--|--|--|--|--|--|--|--|--|--|
| | init. | 7 | | | | | | | | | | | | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | KJL | | | | | | | | | | | | |

| Concentration ERIMF-7 | Days | | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.8 | 10.2 | 9.9 | |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | |
| Initials | | KJL | | | | | | BPL | | BPL | | CMP | | |

| Concentration ERIMF-8 | Days | | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | |
| pH | | 7.3 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | |
| Initials | | KJL | | | | | | BPL | | BPL | | CMP | | |

| Concentration ERIMF-9 | Days | | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | |
| Initials | | KJL | | | | WM | | BPL | | BPL | | CMP | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/AND/CMP
KYL/RJL
 Reviewed by: SS
 Date reviewed: 001911129

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck (can)
 Sample ID: N/A
 Work Order #: N/A

Hatch Embryo
 Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: *Oncorhynchus mykiss* MM
Redside shiner

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ERIMF-10 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.8 | 10.0 | 10.1 | 10.0 | 9.9 | 10.0 | 10.1 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | MM | | BPL | | BPL | | CMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ERIMF-11 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 9.8 | 10.2 | 10.1 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | A | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BPL | | BPL | | CMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ERIMF-12 | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 9.9 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BPL | | BPL | | CMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ERMF-B | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BPL | | BPL | | CMP | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Analysts: BPL/AWD/CMP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Halt Embassy

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Oncorhynchus mykiss M19
Redside shiner

| Concentration ERIMF-14 | Days | | | | | | | | | | | | |
|----------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 10.1 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BCL | | BCL | | CMP | |

| Concentration ERIMF-15 | Days | | | | | | | | | | | | |
|----------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 10.1 | 10.0 | 9.9 | 10.0 | 10.0 | 10.2 | 10.1 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BCL | | BCL | | CMP | |

| Concentration ERIMF-16 | Days | | | | | | | | | | | | |
|----------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.8 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.6 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | A | | BCL | | BCL | | CMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | KJL | | | | | | | | | | | |

Thermometer: T-7 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/ALD/CMP
YKL/KJL
 Reviewed by: SS
 Date reviewed: 20191119

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatches

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|------|-----|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| ERIMF-07 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | | | 10.0 | | 10.0 | 9.9 | 10.2 | 9.9 | |
| pH | | | | | | | | 7.5 | | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | | | | | | | 332 | | 333 | 333 | 338 | | |
| Initials | | | | | | | | BPL | | BPL | BPL | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|-----|------|------|------|------|------|-----|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| ERIMF-08 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.6 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | BPL | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.2 | | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.2 | 9.9 | |
| pH | | 7.5 | | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | | |
| Initials | | KJL | | BPL | | BPL | | BPL | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| ERIMF-09 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | 14.0 | | 14.0 | | |
| DO (mg/L) | | | | | | | | | | 10.0 | | 10.2 | | |
| pH | | | | | | | | | | 7.5 | | 7.5 | | |
| Cond. (µS/cm) | | | | | | | | | | 333 | | 338 | | |
| Initials | | | | | | | | | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|------|-----|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| ERIMF-10 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | | | 10.0 | | 10.0 | 9.8 | 10.2 | 10.0 | |
| pH | | | | | | | | 7.5 | | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | | | | | | | 332 | | 333 | | 338 | | |
| Initials | | | | | | | | BPL | | BPL | | BPL | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BPL/AWD/CHP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal Matchless Embryo 337
 Sample ID: N/A Start Date & Time: May 24/2019
 Work Order #: N/A Stop Date & Time: June 13/2019
Test Species: Red side shiner

| Concentration | Days | | | | | | | | | | | | | | | | | |
|------------------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | | 14 | | | 15 | | | 16 | | | 17 | | | 18 | | |
| ERINF-15 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | | | | | | | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | | | | | | | | | | | | | | | |
| pH | | 7.5 | 7.5 | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | | | | | | | |
| Initials | | BPL | | | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | | 14 | | | 15 | | | 16 | | | 17 | | | 18 | | |
| ERINF-16 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 9.9 | | | | | | | | | | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | | | | | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | | | | | | | | | | | | | |
| Initials | | BPL | | BPL | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BPL/ADD/CMP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Tech Corp ~~Hatchery~~ BPL
 Sample ID: N/A BPL Start Date & Time: May 24 2019
 Work Order #: N/A Stop Date & Time: June 13 2019
 Test Species: Reel side chimer

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERTMF-11 | BPL | | | | | | | | | | | |
| Temperature (°C) | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | |
| pH | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERTMF-12 | BPL | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | | |
| pH | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.7 | 7.6 | 7.8 | | | |
| Cond. (µS/cm) | 336 | | 340 | | 337 | | 339 | | | | | |
| Initials | BPL | | BPL | | BPL | | CMP | | BPL | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|----------------|------|------|------|-----|-----|------|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERTMF-13 | BPL | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | | | 14.0 | | | | | |
| DO (mg/L) | 10.0 | 10.0 | 10.0 | 10.0 | | | 10.0 | | | | | |
| pH | 7.5 | 7.6 | 7.5 | 7.5 | | | 7.5 | | | | | |
| Cond. (µS/cm) | 336 | | 340 | | | | | | | | | |
| Initials | BPL | | BPL | | BPL | | | | | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|----------------|------|------|------|------|------|------|------|------|------|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERTMF-14 | BPL | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 9.9 | 9.9 | | |
| pH | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.7 | 7.6 | 7.7 | | | |
| Cond. (µS/cm) | 336 | | 340 | | 337 | | 339 | | 336 | | | |
| Initials | BPL | | BPL | | BPL | | CMP | | BPL | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL / ALD / CMP
YYL / KJL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch Embryo BPL

Start Date & Time: May 24 / 2019
 Stop Date & Time: June 13 / 2019
 Test Species: Redside shiner

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|------------------|------|--------------|------|---------------|-----|---------------|-----|---------------|-----|---------------|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERINF-07 | BPL 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | | 10.0 | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.5 | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | |
| Initials | | BPL | | | BPL | | | | | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|------------------|------|--------------|-----|---------------|-----|---------------|-----|---------------|-----|---------------|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERINF-08 | BPL 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| Temperature (°C) | | 14.0 | 14.0 | | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | | 10.0 | | | | | | | |
| pH | | 7.5 | 7.5 | | 7.5 | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | |
| Initials | | BPL | | | BPL | | | | | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|------------------|-----|--------------|-----|---------------|-----|---------------|-----|---------------|-----|---------------|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERINF-09 | BPL 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| Temperature (°C) | | | 13.5 | | | | | | | | | |
| DO (mg/L) | | | 10.0 | | | | | | | | | |
| pH | | | 7.5 | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | |
| Initials | | BPL | | | | | | | | | | |

| Concentration | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | |
|------------------|------------------|------|--------------|------|---------------|-----|---------------|-----|---------------|-----|---------------|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new |
| ERINF-10 | BPL 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | | 10.0 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | | 7.5 | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | | | | | | | |
| Initials | | BPL | | BPL | | BPL | | | | | | |

DO meter: DD-3 pH meter: pH-3 Conductivity meter: cond-3

| | |
|-------------|--|
| Control | |
| Hardness* | |
| Alkalinity* | |

Analysts: BPL / ALD / CMP
YYL / KJL
 Reviewed by: SS
 Date reviewed: 201911179

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| ERM7-11 | | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | | | | | | | | | | | 10.0 | 9.7 | 10.7 | 9.9 |
| pH | | | | | | | | | | | | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | | | | | | | | | | | 333 | 335 | | |
| Initials | | | | | | | | | | BPL | | BPL | BPL | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| ERM7-12 | | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | | | | | | | | | | | 10.0 | 9.8 | 10.2 | 10.1 |
| pH | | | | | | | | | | | | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | | | | | | | | | | | 333 | 338 | | |
| Initials | | | | | | | | | | BPL | | BPL | BPL | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| ERM7-13 | | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | | | | | | | | | | | 10.0 | 9.8 | 10.2 | 10.1 |
| pH | | | | | | | | | | | | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | | | | | | | | | | | 333 | 338 | | |
| Initials | | | | | | | | | | BPL | | BPL | BPL | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| ERM7-14 | | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | | | | | | | | | | | 10.0 | 9.8 | 10.2 | 10.0 |
| pH | | | | | | | | | | | | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | | | | | | | | | | | 333 | 338 | | |
| Initials | | | | | | | | | | BPL | | BPL | BPL | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/ALD/CMP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019111129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Redside shiner

| Concentration ERMF-15 | Days | | | | | | | | | | | | | |
|--------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration ERMF-16 | Days | | | | | | | | | | | | | |
|--------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: COND-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BPL/ALD/CMR
YYL/KJL
 Reviewed by: _____
 Date reviewed: _____

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Toxic Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24 2019
 Stop Date & Time: June 13 2019
 Test Species: Redside Shiner

| Concentration ERIMF-07 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|-------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.7 | 7.8 | 7.9 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 337.5 | | 336 | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | |

| Concentration ERIMF-08 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.1 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 330 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | |

| Concentration ERIMF-09 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | |

| Concentration ERIMF-10 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.6 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 339 | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO₃

Analysts: BPL/ALD/CMP
YYL/KJL

Reviewed by: SS
Date reviewed: 2019/11/29

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Peak Coal
 Sample ID: N/A
 Work Order #: N/A

Match 30

Start Date & Time: May 24 2019
 Stop Date & Time: June 13 2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| ERIME-11 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 9.9 | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| ERIME-12 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| ERIME-13 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| ERIME-14 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.9 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | | |
| Initials | | BPL | | BPL | | BPL | | CMP | | BPL | | CMP | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/ALD/CMP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911129

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Tack Corp
 Sample ID: N/A
 Work Order #: N/A

Hatch ^{BSL}

Start Date & Time: May 24 / 2019
 Stop Date & Time: Jun 13 / 2019
 Test Species: Roadside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| ERIMF-15 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.7 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BSL | | BSL | | BSL | | CMP | | BSL | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| ERIMF-16 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.1 | 10.1 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.7 | 7.9 | 7.8 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BSL | | BSL | | BSL | | CMP | | BSL | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Analysts: BSL/AVD/CMP
YYL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Halen ^{BS}
 Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Redside darter

| Concentration ERMF-07 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.8 | 10.2 | 9.9 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | Cmf | | Cmf | | | | | | | | | | |

| Concentration ERMF-08 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | Cmf | | Cmf | | | | | | | | | | |

| Concentration ERMF-09 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.2 | 10.1 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | Cmf | | Cmf | | | | | | | | | | |

| Concentration ERMF-10 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.2 | 10.0 | | | | | | | | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | Cmf | | Cmf | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/AWD/CMP
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019/11/29

* mg/L as CaCO₃

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck (oa)
 Sample ID: N/A
 Work Order #: N/A

Match

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Reidside shiner

| Concentration ERIMF-11 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

| Concentration ERIMF-12 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.2 | 10.2 | 10.0 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

| Concentration ERIMF-13 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.8 | 10.2 | 10.0 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

| Concentration ERIMF-14 | Days | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.7 | 10.1 | | | | | | | | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO₃

Analysts: BPL/AWD/CML
YYL/KJL
 Reviewed by: SS
 Date reviewed: 201911179

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Client: Tack Coal
 Sample ID: N/A
 Work Order #: N/A

Mark 95L

Start Date & Time: May 24/2019
 Stop Date & Time: June 13/2019
 Test Species: Robide shrimp

| Concentration ERIME-15 | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.1 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

| Concentration ERIME-16 | Days | | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | |
| DO (mg/L) | | 10.0 | 9.8 | 10.2 | 10.1 | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | | | | | | | | | |
| Initials | | CML | | CML | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | | | | | | | | | | | | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | | | | | | | | | | | | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/AWD/CML
YYL/KJL
 Reviewed by: SS
 Date reviewed: 2019111129

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BS} May 24/19
 Stop Date & Time: June 13/2019
 Test Species: Redside shiner

| Concentration <i>SPU</i> | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/ Alevins | | | | |
|-----------------------------|-----|----------------------------------|---|-----|-----|---|---|---|---|---|-----|-----|-----|--|--------|--|----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Fast | Unfast | | | |
| ERIMF-6 | 1 | 0 | 0 | 0 | | | | | | | | | | | | | | |
| ERIMF-7 | 2 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 56 | 66 |
| ERIMF-8 | 3 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 23 | 23 |
| ERIMF-9 | 4 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 4 | 95 |
| ERIMF-10 | 1 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 86 | 81 |
| ERIMF-11 | 2 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 39 | 128 |
| ERIMF-12 | 3 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 59 | 92 |
| ERIMF-13 | 4 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 23 | 134 |
| ERIMF-14 | 1 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 77 | 128 |
| ERIMF-15 | 2 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 60 | 186 |
| ERIMF-16 | 3 | ↓ | ↓ | ↓ | | | | | | | | | | | | | 48 | 152 |
| | 4 | | | | | | | | | | | | | | | | | |
| ERIMF-07 B | 1 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | | | | | |
| 07 C | 2 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | | | | |
| 08 B | 3 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1 | | | | | |
| 09 B | 4 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | | | | |
| 10-B | 1 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | 2 | | | |
| 10-C | 2 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | 4 | | | |
| 11-B | 3 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | | | | |
| 12-B | 4 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | | | | |
| 12-C | 1 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1 | | | | | |
| 13-B | 2 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 0 | | | | | |
| 14-B | 3 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | | | |
| 14-C | 4 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | | | |
| 15-B | 1 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | | | |
| 15-C | 2 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | | | |
| 16-B | 3 | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | | |
| Tech Initials | | BSL | P | BSL | BSL | W | W | W | P | P | BSL | BSL | BSL | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 20191113 29

Embryo-Alevin Toxicity Test Daily Mortality

Client: Toxic Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BSR} May 24 / 2019
 Stop Date & Time: June 13 / 2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|-----|-----|-----|----|----|----|----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ERIMF-07-B | 1 | 0 | 0 | | | | | | | | | | | |
| | 2 | 1 | | | | | | | | | | | | |
| ERIMF-08-B | 3 | 0 | 0 | | | | | | | | | | | |
| ERIMF-09-B | 4 | 0 | 0 | | | | | | | | | | | |
| ERIMF-10-B | 1 | 0 | 0 | 0 | | | | | | | | | | |
| | 2 | | | 0 | | | | | | | | | | |
| ERIMF-11-B | 3 | | | | | | | | | | | | | |
| ERIMF-12-B | 4 | | | 0 | 0 | | | | | | | | | |
| | 1 | | | 0 | 0 | | | | | | | | | |
| ERIMF-13-B | 2 | 0 | 0 | 0 | | | | | | | | | | |
| ERIMF-14-B | 3 | 0 | 0 | 0 | | | | | | | | | | |
| | 4 | 0 | 0 | 0 | 0 | | | | | | | | | |
| ERIMF-15-B | 1 | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| ERIMF-16-B | 3 | 1 | 0 | 0 | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BSV | BSV | BSV | CMF | | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/19
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{EST} May 24/2019
 Stop Date: June 13/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments | |
|---------------|----------------------------|---|---|---|---|---|----------------|-----|---|----|-----|-----|----------|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| ERIMF-07B | | | | | | | | | | 4 | 9 | 7 | | |
| 07C | | | | | | | | | - | - | - | - | | |
| ERIMF-08B | | | | | | | 7 [Ⓢ] | 0 | 0 | 6 | 2 | 2 | | |
| ERIMF-09B | | | | | | | | - | - | - | - | 1 | | |
| ERIMF-10B | | | | | | | | | | 20 | 2 | 16 | | |
| C | | | | | | | | | - | 10 | 4 | 13 | | |
| ERIMF-11-B | | | | | | | | | | 25 | | | | |
| ERIMF-12 B | | | | | | | | | | 8 | 3 | 3 | | |
| C | | | | | | | | | | - | 3 | - | | |
| ERIMF-13-B | | | | | | | | | | 2 | 4 | - | | |
| ERIMF-14-B | | | | | | | | | | 7 | 0 | 19 | | |
| C | | | | | | | | | | 4 | 4 | 5 | | |
| ERIMF-15B | | | | | | | | | | 1 | - | - | | |
| 15C | | | | | | | | | | 6 | 4 | - | | |
| ERIMF-16B | | | | | | | | | | 1 | 5 | 7 | | |
| Tech Initials | | | | | | | | SSC | ~ | ~ | BSC | BSC | CMF | |

Comments: Ⓢ vary pale, underdeveloped -

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24 2019
 Stop Date: June 13 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|----|-----|----|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ERIMF-07-B | 2 | 1 | | | | | | | | | | | |
| 07-C | 0 | | | | | | | | | | | | |
| ERIMF-08-B | 1 | 1 | | | | | | | | | | | |
| ERIMF-09-B | 3 | | | | | | | | | | | | |
| ERIMF-10-B | 27 | 1 | 1 | | | | | | | | | | |
| C | 4 | 1 | 2 | | | | | | | | | | |
| ERIMF-11-B | | | | | | | | | | | | | |
| ERIMF-12-B | 4 | 7 | 0 | 1 | | | | | | | | | |
| C | 0 | 0 | 0 | 0 | 1 | | | | | | | | |
| ERIMF-13-B | 4 | 1 | 3 | | | | | | | | | | |
| ERIMF-14-B | 22 | 5 | 2 | | | | | | | | | | |
| C | 8 | 1 | 0 | | | | | | | | | | |
| ERIMF-15-B | 24 48 | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| ERIMF-16-B | 25 | 12 | 1 | | | | | | | | | | |
| Tech Initials | BL | BL | BL | CMP | BL | | | | | | | | |

Comments: _____

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

GR
 Start Date & Time: May 24/2019
 Stop Date: June 13/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|---|---|---|---|---|---|---|---|----|----|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ERIMF-07 B | | | | | | | | | | 0 | 0 | 7 | |
| C | | | | | | | | | | | | 0 | |
| ERIMF-08 B | | | | | | | | | | | | 2 | |
| ERIMF-09 B | | | | | | | | | | | | 6 | |
| ERIMF-10 B | | | | | | | | | | | | 10 | |
| C | | | | | | | | 0 | 0 | | | 3 | |
| ERIMF-11 B | | | | | | | | | | | | 3 | |
| ERIMF-12 B | | | | | | | | | | | | 1 | |
| C | | | | | | | | | | | | 1 | |
| ERIMF-13 B | | | | | | | | | | | | 1 | |
| ERIMF-14 B | | | | | | | | | | | | 1 | |
| C | | | | | | | | | | | | 1 | |
| ERIMF-15 B | | | | | | | | | | | | 1 | |
| C | | | | | | | | | | | | 1 | |
| ERIMF-16 B | | | | | | | | | | | | 1 | |
| Tech Initials | EK R ~ BCL BCL BCL/CLP | | | | | | | | | | | | |

Comments: _____

SS
2019/12/19

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24 12:01 PM 2019
 Stop Date: June 13 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | |
|---------------|--|-----|-----|-----|----------------|-----|-----|-----|-----|----|----|----|----------|--|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | |
| ERIMF-07-B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| C | | | | | | | | | | | | | | |
| ERIMF-08-B | | | | | | | | | | | | | | |
| ERIMF-09-B | | | | | | | | | | | | | | |
| ERIMF-10-B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| ERIMF-11-B | | | | | 1 | | | | | | | | | |
| ERIMF-12-B | | | | | 1 [ⓐ] | | | | | | | | | |
| C | | | | | 0 | | | | | | | | | |
| ERIMF-13-B | | | | | | | | | | | | | | |
| ERIMF-14-B | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | |
| ERIMF-15-B | | | | | 1 | | | | | | | | | |
| C | | | | | 1 | | | | | | | | | |
| ERIMF-16-B | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | |
| Tech Initials | BLV | BLV | BLV | CWP | BLV | BLV | BLV | BLV | BLV | | | | | |

Comments: ⓐ skeletal 3, craniofacial 3, finfold 3, yolk 2

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal Embryo
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24/2019
 Stop Date & Time: June 14/2019
 Test Species: Redside shiner

| Concentration STPD-02 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | 10.2 | 10.3 | 10.0 | 9.9 | 9.9 | 10.1 | 10.1 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.2 |
| pH | 7.8 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.6 |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | BSL | BSL | | A | | CML | | CML | | W/BSL | | KRL | |

| Concentration STPD-03 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 9.9 | 10.1 | 10.1 | 10.3 | 10.1 |
| pH | 7.8 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | BSL | BSL | | A | | CML | | CML | | W/BSL | | KRL | |

| Concentration STPD-04 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.1 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.1 |
| pH | 7.8 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.6 |
| Cond. (µS/cm) | 332 | 338 | | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | BSL | BSL | | A | | CML | | CML | | W/BSL | | KRL | |

| Concentration STPD-05 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 |
| DO (mg/L) | 10.2 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.1 |
| pH | 7.8 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 |
| Cond. (µS/cm) | 332 | 7.5 | 338 | 338 | | 336 | | 339 | | 334 | | 332 | |
| Initials | BSL | BSL | | A | | CML | | CML | | W/BSL | | KRL | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BSL/AWS/CML/KRL/SS

Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 24 / 2019
 Stop Date & Time: June 14 / 2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| STPD-06 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.0 | 9.9 | 9.8 | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.0 | 10.3 | 10.1 | |
| pH | 7.8 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | 7.5 | 7.4 | 7.6 | |
| Cond. (µS/cm) | 332 | 335 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BRL | BRL | | A | | CML | | CML | | M/BRL | | KJL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| STPD-07 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 13.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.9 | 10.1 | 10.0 | 10.0 | 10.2 | 10.1 | 10.0 | 10.3 | 10.1 | |
| pH | 7.8 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 335 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BRL | BRL | | A | | CML | | CML | | M/BRL | | KJL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| ERW55-01 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 13.0 | 14.0 | 13.5 | 14.0 | 13.5 | 14.0 | 13.5 | 13.5 | 13.5 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | 10.2 | 10.3 | 10.1 | 9.9 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 10.1 | 10.3 | 10.1 | |
| pH | 7.8 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.4 | 7.5 | |
| Cond. (µS/cm) | 332 | 335 | | 338 | | 336 | | 339 | | 334 | | 332 | | |
| Initials | BRL | BRL | | A | | CML | | CML | | M/BRL | | KJL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3

pH meter: pH-3

Conductivity meter: Cond.-3

Analysts: BRL/AWD/CML/M/BRL/KJL

| | | | | |
|-------------|--------------------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | Control | | | |

* mg/L as CaCO3

Reviewed by: SS
 Date reviewed: 2019/11/29

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 24/19
 Stop Date & Time: June 14/2019
 Test Species: Oncorhynchus mykiss 3pc
Rockside Shovel

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-02 | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 9.9 | 10.2 | 9.9 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | | KJL | | A | | A | | BSC | | BSC | | CMF | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-03 | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 10.1 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | | KJL | | A | | A | | BSC | | BSC | | CMF | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-04 | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.2 | 10.1 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | | KJL | | A | | A | | BSC | | BSC | | CMF | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-05 | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 |
| DO (mg/L) | | 10.1 | 10.2 | 9.8 | 9.8 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.0 | 10.2 | 10.1 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 333 | |
| Initials | | KJL | | A | | A | | BSC | | BSC | | CMF | |

Thermometer: T-9 DO meter: DO-3 pH meter: PH-3 Conductivity meter: C-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BSC/KJL/CMF/442/KJL

Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal Embryo
 Sample ID: N/A
 Work Order #: 512

Start Date & Time: May 24/19
 Stop Date & Time: June 14/2019
 Test Species: Oreochromis mykiss
Redtail shiner

| Concentration STPD-06 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.1 | 10.0 | 9.9 | 10.0 | 12.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.4 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | r | | BVL | | BVL | | CMP | |

| Concentration STPD-07 | Days | | | | | | | | | | | | |
|--------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 12.1 | 10.0 | 10.1 | 10.0 | 10.0 | 10.2 | 10.0 |
| pH | | 7.3 | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | r | | BVL | | BVL | | CMP | |

| Concentration ERWSF-01 | Days | | | | | | | | | | | | |
|---------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 12.1 | 10.0 | 10.0 | 10.0 | 10.1 | 10.2 | 10.0 |
| pH | | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 332 | | 333 | | 333 | | 332 | | 333 | | 338 | |
| Initials | | KJL | | A | | r | | BVL | | BVL | | CMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3
 Analysts: BVL/AJD/CMP/KJL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Sample Description: _____
 Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Conl.
 Sample ID: N/A
 Work Order #: N/A

Embryo ^{BPL}

Start Date & Time: May 24 / 2019
 Stop Date & Time: June 14 / 2019
 Test Species: Reside stiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-02 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.8 | 7.9 | 7.7 | 7.8 | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BPL | | BPL | | BPL | | CMF | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-03 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 9.9 | | | | | |
| pH | | 7.5 | 7.6 | 7.2 | 7.5 | 7.8 | 7.8 | 7.7 | 7.7 | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BPL | | BPL | | BPL | | CMF | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-04 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.8 | 7.8 | 7.7 | 7.7 | 7.9 | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BPL | | BPL | | BPL | | CMF | | BPL | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-05 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 9.9 | | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.8 | 7.9 | 7.7 | 7.8 | 7.9 | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BPL | | BPL | | BPL | | CMF | | BPL | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

Analysts: BPL/AWL/CMF/KYL/KJL

Reviewed by: SS

Date reviewed: 201911129

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

Client: Texas Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24/2019
 Stop Date & Time: June 10/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STP06 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.8 | 7.9 | 7.7 | 7.8 | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BSL | | BSL | | BSL | | CMP | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STP07 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | | | | | |
| pH | | 7.5 | 7.6 | 7.5 | 7.5 | 7.8 | 7.8 | 7.7 | 7.7 | | | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BSL | | BSL | | BSL | | CMP | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|-----|------|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ERWSF-01 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | 14.0 | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | | 9.9 | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.8 | 7.9 | 7.7 | 7.6 | | 7.9 | | | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | | | | | |
| Initials | | BSL | | BSL | | BSL | | CMP | | | BSL | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BSL/AW/CMP/ML/KSL
 Reviewed by: SS
 Date reviewed: 2019/11/29

| | | | | |
|-------------|--------------------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | Control | | | |

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teek coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 29 / 2019
 Stop Date & Time: June 14 / 2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| STEP-02 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| DO (mg/L) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| pH | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Cond. (µS/cm) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Initials | | / | / | / | / | / | / | / | / | / | / | / | / | / |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|------|-----|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| STEP-03 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | / | / | / | / | / | / | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | / | / | / | / | / | / | 12.0 | / | 10.0 | 9.9 | 10.0 | 10.0 | |
| pH | | / | / | / | / | / | / | 7.5 | / | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | / | / | / | / | / | / | 332 | | 333 | | 336 | | |
| Initials | | / | / | / | / | / | / | BSL | | BSL | | BSL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| STEP-04 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| DO (mg/L) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| pH | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Cond. (µS/cm) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Initials | | / | / | / | / | / | / | / | / | / | / | / | / | / |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| STEP-05 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| DO (mg/L) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| pH | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Cond. (µS/cm) | | / | / | / | / | / | / | / | / | / | / | / | / | / |
| Initials | | / | / | / | / | / | / | / | / | / | / | / | / | / |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BR/AND/COMP/VKL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch.

Start Date & Time: May 24/2019
 Stop Date & Time: June 14/2019
 Test Species: Redside darters

| Concentration STPD-06 | Days | | | | | | | | | | | | | |
|--------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | / | | / | | / | | / | | / | | / | |
| DO (mg/L) | | | / | | / | | / | | / | | / | | / | |
| pH | | | / | | / | | / | | / | | / | | / | |
| Cond. (µS/cm) | | | / | | / | | / | | / | | / | | / | |
| Initials | | | / | | / | | / | | / | | / | | / | |

| Concentration STPD-07 | Days | | | | | | | | | | | | | |
|--------------------------|-------|-----|-----|-----|-----|-----|-----|------|-----|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | / | | / | | / | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | / | | / | | / | 10.0 | / | 10.0 | 9.9 | 10.2 | 10.2 | |
| pH | | | / | | / | | / | 7.5 | / | 7.5 | 7.6 | 7.5 | 7.5 | |
| Cond. (µS/cm) | | | / | | / | | / | 532 | / | 533 | | 335 | | |
| Initials | | | / | | / | | / | BPC | / | BP | | SS | | |

| Concentration ERWSF-01 | Days | | | | | | | | | | | | | |
|---------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | / | | / | | / | | / | | / | | / | |
| DO (mg/L) | | | / | | / | | / | | / | | / | | / | |
| pH | | | / | | / | | / | | / | | / | | / | |
| Cond. (µS/cm) | | | / | | / | | / | | / | | / | | / | |
| Initials | | | / | | / | | / | | / | | / | | / | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BPL/AWL/CMP/ELC/KSL
 Reviewed by: SS
 Date reviewed: 201911129

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Toxic Cont
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24 / 2019
 Stop Date & Time: June 14 / 2019
 Test Species: Redside shiner

| Concentration STPD-02 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | / | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.1 | 10.0 | |
| pH | | 7.5 | / | 7.6 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | / | 340 | | 337 | | 339 | | 335 | | 336 | | |
| Initials | | BR | | BR | | BR | | CMP | | BR | | CMP | | |

| Concentration STPD-03 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.6 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 335 | | 336 | | |
| Initials | | BR | | BR | | BR | | CMP | | BR | | CMP | | |

| Concentration STPD-04 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | / | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 9.9 | |
| pH | | 7.5 | / | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.6 | 7.9 | 7.8 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 335 | | 336 | | |
| Initials | | BR | | BR | | BR | | CMP | | BR | | CMP | | |

| Concentration STPD-05 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | / | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | / | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.5 | / | 7.5 | 7.6 | 7.8 | 7.8 | 7.7 | 7.7 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 335 | | 336 | | |
| Initials | | BR | | BR | | BR | | CMP | | BR | | CMP | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond. -3

Analysts: BPL/AND/KMP/WYL/KSL

Reviewed by: SS

Date reviewed: 201911129

| | | | | |
|-------------|----------------|--|--|--|
| Hardness* | <u>Control</u> | | | |
| Alkalinity* | <u>Control</u> | | | |

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Task Code
 Sample ID: N/A
 Work Order #: N/A

Hatch

Start Date & Time: May 24/2019
 Stop Date & Time: June 14/2019
 Test Species: Reidside Stuber

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|------|-----|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-06 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | 10.0 | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | | | 7.5 | | 7.4 | 7.9 | 7.7 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | | | BR | | BR | | CM | | SR | | CM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| STPD-07 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BR | | BR | | BR | | CM | | SR | | CM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----|------|------|------|------|------|------|------|------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ERWSF-01 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | |
| pH | | 7.5 | | 7.5 | 7.6 | 7.8 | 7.9 | 7.7 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 340 | | 337 | | 339 | | 338 | | 336 | | |
| Initials | | BR | | BR | | BR | | CM | | SR | | CM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BPL/AND/COB/KYL/KJL
 Reviewed by: SS
 Date reviewed: 2019112119

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Teck Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24 2019
 Stop Date & Time: June 14 2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | | 20 | | 21 | | 22 | | 23 | | 24 | | |
| STPD-02 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 9.9 | 10.2 | 10.1 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | | 20 | | 21 | | 22 | | 23 | | 24 | | |
| STPD-03 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 9.8 | 10.2 | 10.0 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | | 20 | | 21 | | 22 | | 23 | | 24 | | |
| STPD-04 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | | 20 | | 21 | | 22 | | 23 | | 24 | | |
| STPD-05 | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.0 | 10.2 | 10.1 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BPL/AMJ/CMP/KYL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test Water Quality Measurements

Client: Tecol Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 24/2019
 Stop Date & Time: June 11/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| STPD-06 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| STPD-07 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.1 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|
| | init. | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | new |
| ERWSF-01 | | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | 10.1 | 10.2 | | | | | | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | | | | | | | |
| Cond. (µS/cm) | | 338 | | 337 | | 334 | | | | | | | | |
| Initials | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | | | |
|-------------|--|--|--|
| Control | | | |
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BPL/ANDJ/CMP/YHL/KSL
 Reviewed by: SS
 Date reviewed: 201911129

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal Start Date & Time: ^{3P} May 24/2019
 Sample ID: N/A Stop Date & Time: June 14/2019
 Work Order #: N/A Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | | |
|---------------|-----|----------------------------------|----|-----|-----|---|---|---|-----|---|-----|-----|-----|---------------------------------|--------|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Test | Unfert | |
| STPD-02 | 1 | 0 | 0 | | | | | | | | | | | 96 | 194 | 103 |
| STPD-03 | 2 | ↓ | ↓ | | | | | | | | | | | 33 | | 141 |
| STPD-04 | 3 | ↓ | ↓ | | | | | | | | | | | 148 | | 161 |
| STPD-05 | 4 | ↓ | ↓ | | | | | | | | | | | 148 | | 162 |
| STPD-06 | 1 | ↓ | ↓ | | | | | | | | | | | 66 | | 33 |
| STPD-07 | 2 | ↓ | ↓ | | | | | | | | | | | 56 | | 38 |
| | 3 | | | | | | | | | | | | | 86 | | 42 |
| ERWSF-01 | 4 | 0 | 0 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| STPD-02 B | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| 02 C | 2 | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | |
| 02 D | 3 | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | |
| 02 E | 4 | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | |
| 03 B | 1 | | | | 4 | 0 | | | | | | | | | | |
| 04 B | 2 | | | | 0 | 0 | | | | | | | | | | |
| 04 C | 3 | | | | 5 | 0 | | | | | | | | | | |
| 04 D | 4 | | | | 4 | 0 | | | | | | | | | | |
| 05-B | 1 | | | | 4 | 0 | | | | | | | | | | |
| 05-C | 2 | | | | 4 | 0 | | | | | | | | | | |
| 05-D | 3 | | | | 3 | 0 | | | | | | | | | | |
| 06-B | 4 | | | | 3 | 0 | | | | | | | | | | |
| 06-C | 1 | | | | 1 | 0 | | | | | | | | | | |
| 07-B | 2 | | | | 3 | 0 | | | | | | | | | | |
| 07-C | 3 | | | | 0 | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| ERWSF-01 B | 1 | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | 2 |
| C | 2 | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | 0 |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| Tech Initials | | BRL | or | BRL | BRL | W | K | W | BRL | W | BRL | BRL | BRL | | | |

Comments: ① unviable
② developed but died before hatch

Reviewed by: SS Date reviewed: 201911129

Embryo-Alevin Toxicity Test Daily Mortality

Client: Test Coal
 Sample ID: N/A
 Work Order #: N/A

BFC

Start Date & Time: May 24/2019
 Stop Date & Time: June 14/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|-----|-----|-----|-----|----|----|----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD-02 B | 1 | 0 | 0 | 0 | 0 | | | | | | | | | |
| C | 2 | 0 | 1 | 0 | 0 | | | | | | | | | |
| D | 3 | 0 | 1 | 0 | | | | | | | | | | |
| E | 4 | 0 | | 0 | 0 | | | | | | | | | |
| STPD-03 B | 1 | | | 0 | 0 | | | | | | | | | |
| STPD-04 B BFC | 2 | | | 0 | 0 | | | | | | | | | |
| C | 3 | | | 0 | | | | | | | | | | |
| D | 4 | | | 0 | 0 | 1 | | | | | | | | |
| STPD-05 -B | 1 | | | 0 | | | | | | | | | | |
| C | 2 | | | | | | | | | | | | | |
| D | 3 | | | | | | | | | | | | | |
| STPD-06 -B | 4 | | | | | | | | | | | | | |
| C | 1 | | | | | | | | | | | | | |
| STPD-07 B | 2 | | | | | | | | | | | | | |
| C | 3 | | | | | | | | | | | | | |
| EBWSF-0-B | 4 | 0 | | | | 1 | | | | | | | | |
| C | 1 | 1 | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BFC | BFC | BFC | CML | BFC | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/19
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{SS} May 24/2019
 Stop Date: Jun 14/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|----------------------|----------------------------|----|----|-----|----|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD-02-B | 8 | 35 | 6 | 2 | | | | | | | | | |
| C | 15 | 20 | 10 | 2 | | | | | | | | | |
| D | 0 | 23 | 23 | | | | | | | | | | |
| E | 3 | 41 | 5 | 1 | | | | | | | | | |
| STPD-03-B | 3 | 8 | 2 | 2 | | | | | | | | | |
| STPD-04-B | 2 | 21 | 11 | 12 | | | | | | | | | |
| C | 0 | 1 | 43 | | | | | | | | | | |
| D | 0 | 23 | 8 | 6 | | | | | | | | | |
| STPD-05-B | 0 | 5 | 35 | 3 | 3 | | | | | | | | |
| C | 6 | 24 | 9 | 0 | 4 | | | | | | | | |
| D | 0 | 34 | 9 | 0 | 1 | | | | | | | | |
| STPD-06-B | 0 | 14 | 27 | 3 | | | | | | | | | |
| C | 0 | 0 | 2 | 13 | | | | | | | | | |
| STPD-07-B | 8 | 7 | 1 | 1 | | | | | | | | | |
| C | 0 | 1 | 0 | 1 | | | | | | | | | |
| STPD-08-B | | | | | | | | | | | | | |
| ERWSF-01-B | 31 | 6 | 1 | 1 | | | | | | | | | |
| C | 13 | 12 | | | | | | | | | | | |
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| | | | | | | | | | | | | | |
| Tech Initials | BR | BR | BR | CMP | BR | | | | | | | | |

Comments: _____

SS
201911129

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{EST} May 24 / 2019
 Stop Date: June 14 / 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | |
|---------------|--|---|---|---|---|---|---|---|---|----|----|----|----------|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| STPD-02-B | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| D | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| E | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| STPD-03-B | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 | | |
| STPD-04-B | - | - | - | - | - | - | - | - | - | - | - | - | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | | |
| D | - | - | - | - | - | - | - | - | - | - | - | - | | |
| STPD-05-B | - | - | - | - | - | - | - | - | - | - | - | - | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | | |
| D | - | - | - | - | - | - | - | - | - | - | - | - | | |
| STPD-06-B | - | - | - | - | - | - | - | - | - | - | - | - | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | | |
| STPD-07-B | - | - | - | - | - | - | - | - | - | 0 | 0 | 0 | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | | |
| ERWSF04B | - | - | - | - | - | - | - | - | - | - | - | - | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | | |
| Tech Initials | | | | | | | | | | | BL | BL | BL | |

Comments: _____

SS

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ⁰⁸ May 24 12019
 Stop Date: June 14 12019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|-----|-----|----|-----|-----|-----|-----|-----|-----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD-02-B | - | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | / |
| C | - | | 0 | | | | | | | | | | |
| D | - | | 1 | | | | | | | | | | |
| E | - | | 0 | | | | | | | | | | |
| STPD-03-B | 0 | | 1 | | | | | | | | | | |
| STPD-04-B | - | | 1 | | | | | | | | | | |
| C | - | | 0 | | | | | | | | | | |
| D | - | | | | | | | | | | | | |
| STPD-05-B | - | | | | | | | | | | | | |
| C | - | | | | | | | | | | | | |
| STPD-06-B | - | | | | | | | | | | | | |
| C | - | | | | | | | | | | | | |
| STPD-07-B | 0 | | | | | | | | | | | | |
| C | 0 | | | | | | | | | | | | |
| ERWST-a-B | - | | | | | | | | | | | | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | |
| Tech Initials | SL | BSL | BSL | MP | BSL | BSL | BSL | BSL | BSL | BSL | | | |

Comments:

SS

2019/11/24

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Embryo

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: ~~Oncorhynchus mykiss~~ BPL
Redside shiner

| Short dry fast Concentration EWRSF-02 | Days | | | | | | | | | | | | | |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.3 | 10.1 | 10.1 | 10.1 | 10.0 | 9.8 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | |
| pH | / | 7.4 | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.4 | 7.6 | 7.5 | 7.5 | 7.6 | |
| Cond. (µS/cm) | / | 332 | | 332 | | 333 | | 333 | | 332 | | 333 | | |
| Initials | JRE | KSL | | KSL | | BPL | | KSL | | BPL | | BPL | | |

| Extended dry fast Concentration EWRSF-02 | Days | | | | | | | | | | | | | |
|--|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.3 | 10.2 | 10.1 | 10.2 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | |
| pH | / | 7.4 | 7.4 | 7.3 | 7.5 | 7.6 | 7.5 | 7.6 | 7.4 | 7.6 | 7.5 | 7.5 | 7.6 | |
| Cond. (µS/cm) | / | 332 | | 332 | | 333 | | 333 | | 332 | | 333 | | |
| Initials | JRE | KSL | | KSL | | BPL | | KSL | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | / | | |
| Alkalinity* | / | | |

Analysts: JRE, KSL, AWD, BPL

Reviewed by: SS
 Date reviewed: 2020102127

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: May 29/19
 Stop Date & Time: June 19/2019
 Test Species: Redside Shiners

| Short Dry Fert. Concentration EWRSF-OZ | Days | | | | | | | | | | | | | | | | | |
|--|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|--|
| | 7 | | | 8 | | | 9 | | | 10 | | | 11 | | | 12 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | |
| DO (mg/L) | | 10.2 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 10.0 | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.8 | 7.8 | 7.7 | 7.7 | 7.9 | 7.8 | | | | | |
| Cond. (µS/cm) | | 338 | 333 | 336 | | 340 | | 337 | | 339 | | 338 | | | | | | |
| Initials | | CMP | | BCL | | BCL | | BCL | | CMP | | BCL | | | | | | |

| Extended Dry Fert. Concentration EWRSF-OZ | Days | | | | | | | | | | | | | | | | | |
|---|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|--|
| | 7 | | | 8 | | | 9 | | | 10 | | | 11 | | | 12 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new | old | new | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | |
| DO (mg/L) | | 10.2 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 10.0 | | | |
| pH | | 7.5 | 7.5 | 7.5 | 7.6 | 7.6 | 7.5 | 7.8 | 7.7 | 7.7 | 7.7 | 7.9 | 7.8 | | | | | |
| Cond. (µS/cm) | | 338 | | 336 | | 340 | | 337 | | 339 | | 338 | | | | | | |
| Initials | | CMP | | BCL | | BCL | | BCL | | CMP | | BCL | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: CMP, BCL
 Reviewed by: SS
 Date reviewed: 2020/02/27

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Redside Shiner

| Short Dry Fert. Concentration EWRSF-02 | Days | | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 9.9 | 10.1 | 9.9 | 10.0 | 10.0 | | | | |
| pH | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | | | | |
| Cond. (µS/cm) | 336 | | 338 | | 337 | | 334 | | 336 | | | | | |
| Initials | CML | | CML | | CML | | CML | | BSC | | | | | |

| Extended Dry Fert. Concentration EWRSF-02 | Days | | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | |
| DO (mg/L) | 10.1 | 9.9 | 10.0 | 9.9 | 10.2 | 9.9 | 10.1 | 10.0 | | | | | | |
| pH | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | |
| Cond. (µS/cm) | 336 | | 338 | | 337 | | 334 | | CE | | | | | |
| Initials | CML | | CML | | CML | | CML | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: CML, BSC
 Reviewed by: SS
 Date reviewed: 2020/02/27

* mg/L as CaCO₃

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch

Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Rocky Mountain Shiner

short dry

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| ERWSF-02 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | 14.0 | |
| DO (mg/L) | | | | | | | | | | | | | 10.0 | |
| pH | | | | | | | | | | | | | 7.9 | |
| Cond. (µS/cm) | | | | | | | | | | | | | 338 | |
| Initials | | | | | | | | | | | | | BRL | |

extended dry

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| ERWSF-02 | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | 14.0 | |
| DO (mg/L) | | | | | | | | | | | | | 10.0 | |
| pH | | | | | | | | | | | | | 7.9 | |
| Cond. (µS/cm) | | | | | | | | | | | | | 338 | |
| Initials | | | | | | | | | | | | | BRL | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Conc-3

| | | | |
|-------------|--------------------|--|--|
| Hardness* | Control | | |
| Alkalinity* | | | |

Analysts: BRL
 Reviewed by: SS
 Date reviewed: 2020/02/27

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teek Coal
 Sample ID: UN
 Work Order #: N/A

Hatch.

Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Reckside Shiner

| Short Dry Concentration ERWSF-02 | Days | | | | | | | | | | | | | | |
|--|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.1 | 9.9 | 10.0 | 9.9 | 10.2 | 10.1 | 10.1 | 9.9 | 10.0 | 10.0 | 10.1 | 10.2 | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | 336 | | 338 | | 337 | | 334 | | 336 | | 337 | | | |
| Initials | | CMP | | CMP | | CMP | | CMP | | BPC | | CMP | | | |

| Extended Dry Concentration ERWSF-02 | Days | | | | | | | | | | | | | | |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 10.1 | 10.2 | 10.0 | 10.1 | 9.8 | 10.0 | 9.9 | 10.1 | 10.1 | | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | 336 | | 338 | | 337 | | 334 | | 336 | | 337 | | | |
| Initials | | CMP | | CMP | | CMP | | CMP | | BPC | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | | | | | |
|-------------|---------|--|--|--|--|
| | Control | | | | |
| Hardness* | / | | | | |
| Alkalinity* | / | | | | |

Analysts: CMP, BPC
 Reviewed by: SS
 Date reviewed: 2020102127

* mg/L as CaCO₃

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Teek Coal

Hatch

Client: _____
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Redside shiner

| Short Day Concentration ERWSFOZ | Days | | | | | | | | | | | | |
|------------------------------------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|--|
| | 19 | | 20 | | 21 | | | | | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.0 | 10.0 | 10.1 | | | | | | |
| pH | | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | | | | | | |
| Cond. (µS/cm) | | 336 | | 333 | | 334 | | | | | | | |
| Initials | | CME | | CME | | CME | | | | | | | |

| Extended Day Concentration ERWSFOZ | Days | | | | | | | | | | | | |
|---------------------------------------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|--|
| | 19 | | 20 | | 21 | | | | | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | | 10.0 | 10.1 | 10.2 | 10.1 | 10.0 | 10.0 | | | | | | |
| pH | | 7.9 | 8.0 | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | |
| Cond. (µS/cm) | | 336 | | 333 | | 334 | | | | | | | |
| Initials | | CME | | CME | | CME | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: CME
 Reviewed by: SS
 Date reviewed: 2020/02/27

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Embryo

Client: Tecol Coal.
 Sample ID: N/A
 Work Order #: N/A

BR
 Start Date & Time: May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | Total Dead Eggs/Embryos/ Alevins | | |
|----------------|-----|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|------------------------|--|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | | 12 | |
| EWRSF-02 | | | | | | | | | | | | | | | |
| short day feed | 1 | 0 | 0 | 0 | | | | | | | | | | 7:59 U:28 7:31 U:91 | |
| EWRSF-02 | 2 | 0 | 0 | 0 | | | | | | | | | | | |
| long day feed | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| EWRSF-02 B-1 | 1 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| short fee 02 C | 2 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 3 | | | | | | | | | | | | | | |
| EWRSF-02 B-2 | 4 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| Tech Initials | | KIL | KIL | BCL | BCL | BCL | BCL | BCL | BCL | BCL | BCL | BCL | OMP | BCL | |

Comments: _____

Reviewed by: SS Date reviewed: 20201021
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Embryo: _____

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{3:00} May 29/2019
 Stop Date & Time: June 19/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/ Alevins |
|----------------------|-----|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|--|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| EWRSE-02 B1 -02 C | 1 | 0 | 0 | 10 | | | | | | | | | | |
| | 2 | 0 | 0 | 0 | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| EWRSE-02 B2 | 4 | 0 | 0 | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BR | BR | BR | | | | | | | | | | |

Comments: (1) developed but died

Reviewed by: SS Date reviewed: 2020102127

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

BR B1
 Start Date & Time: 5 May 29/2019
 Stop Date: June 19/2019
 Test Species: Redside shiner

Shred
Part

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|--------------------|--|---|---|---|---|---|---|---|---|----|----|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| <i>ERWST-02-B1</i> | - | - | - | - | - | - | - | - | - | - | - | - | |
| <i>02C</i> | - | - | - | - | - | - | - | - | - | - | - | - | |
| <i>ERWST-02-B2</i> | - | - | - | - | - | - | - | - | - | - | - | - | |
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| | | | | | | | | | | | | | |
| Tech Initials | <i>ERW BAK CML BSE BR</i> | | | | | | | | | | | | |

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Peck Coal - Embryo
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 1/2019
 Stop Date & Time: June 20/2019
 Test Species: Oreochromis mykiss
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-08 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | 9.3 | 10.0 | 10.5 | 10.0 | 10.0 | 10.0 | 9.5 | 10.2 | 9.9 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | 328 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BPL | WML | | BPL | | BPL | | CMP | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-09 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.1 | 10.0 | 9.8 | 10.0 | 9.9 | 9.9 |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | 328 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BPL | WML | | BPL | | BPL | | CMP | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-10 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | 327 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BPL | WML | | BPL | | BPL | | CMP | | BPL | | BPL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-11 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | 9.5 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | 10.0 | 9.8 | 10.0 | 10.0 | 10.0 |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| Cond. (µS/cm) | 325 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BPL | WML | | BPL | | BPL | | CMP | | BPL | | BPL | | |

Thermometer: 79 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/WML/CMP/BPL/IC
 Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

Start Date & Time: June 1, 2019
 Stop Date & Time: June 7, 2019
 Test Species: Oncorhynchus mykiss
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|-------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-12 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 13.7 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.0 | 9.7 | 10.2 | 10.0 | 10.70 | 10.0 | 10.0 | 9.9 | |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 325 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BSC | WM | | BSC | | BSC | | CMP | | BSC | | BSC | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-13 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 13.3 | 14.0 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 10.0 | 10.0 | 10.2 | 10.0 | 10.0 | 10.0 | 9.9 | 10.2 | 9.8 | 10.0 | 10.1 | 10.0 | 9.9 | |
| pH | 7.5 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 325 | 334 | | 332 | | 333 | | 338 | | 336 | | 340 | | |
| Initials | BSC | WM | | BSC | | BSC | | CMP | | BSC | | BSC | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ERUSE-03 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.5 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | 9.9 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.1 | 10.2 | 10.3 | 10.0 | 9.9 | 10.0 | 10.0 | |
| pH | 7.6 | 7.6 | 7.5 | 7.6 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | |
| Cond. (µS/cm) | 326 | 334 | | 332 | | 333 | | 338 | | 326 | | 340 | | |
| Initials | BSC | WM | | BSC | | BSC | | CMP | | BSC | | BSC | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/AJN/Scampton/KJK

Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Peaks Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

300

Start Date & Time: June 1/2019
 Stop Date & Time: June 20/2019
 Test Species: Em cart hatching mykiss
Keel-side Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| | old | new | old | new | old | new | old | new | old | new | old | new | | old |
| STPD-08 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.1 | 10.0 | 9.9 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 10.0 | |
| pH | | 7.8 | 7.9 | 7.7 | 7.8 | 7.8 | 7.7 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | BR | | CMP | | BR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| | old | new | old | new | old | new | old | new | old | new | old | new | | old |
| STPD-09 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.2 | 10.2 | 10.0 | |
| pH | | 7.8 | 7.8 | 7.7 | 7.7 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | BR | | CMP | | BR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| | old | new | old | new | old | new | old | new | old | new | old | new | | old |
| STPD-10 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 9.9 | 10.2 | 9.9 | |
| pH | | 7.8 | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | BR | | CMP | | BR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | |
| | old | new | old | new | old | new | old | new | old | new | old | new | | old |
| STPD-11 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 9.9 | 10.1 | 9.9 | 10.0 | 9.9 | 10.2 | 10.1 | |
| pH | | 7.8 | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | BR | | CMP | | BR | | CMP | | CMP | | CMP | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BR/ALD/CMP/MY/KCL

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3 Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Fambrago

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 1/2019
 Stop Date & Time: June 2/2019
 Test Species: Oreochromis mossambicus (Mogil)
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-12 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 9.9 | 10.2 | 10.0 | |
| pH | | 7.8 | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | SR | | CMP | | SR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-13 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 9.8 | 10.2 | 10.1 | |
| pH | | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | SR | | CMP | | SR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| ERUST-03 | | | | | | | | | | | | | | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 9.9 | 10.7 | 10.0 | |
| pH | | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | 337 | | 339 | | 338 | | 336 | | 338 | | 337 | | |
| Initials | | SR | | CMP | | SR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BR/CMP/MS/KSL
 Reviewed by: SS
 Date reviewed: 2019/12/18

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teek Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 11/19
 Stop Date & Time: June 20/2019
 Test Species: *Oreochromis mykiss*
Redside Shiner

| Concentration STPD-08 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | | |
| DO (mg/L) | | 10.1 | 10.2 | 10.1 | 10.0 | | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.8 | 7.9 | | | | | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | | | | | | | | | | |
| Initials | | CME | | BSL | | | | | | | | | | | |

| Concentration STPD-09 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 10.0 | | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.8 | 7.8 | | | | | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | | | | | | | | | | |
| Initials | | CME | | BSL | | | | | | | | | | | |

| Concentration STPD-10 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | | 10.1 | 9.9 | 10.0 | 10.1 | 10.1 | 10.0 | 10.0 | 9.9 | | | | | | |
| pH | | 7.9 | 7.8 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | | | | | | |
| Initials | | CME | | BSL | | CME | | CME | | | | | | | |

| Concentration STPD-11 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.8 | 10.1 | 10.0 | 10.0 | 9.9 | | | | | | |
| pH | | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | | | | | | |
| Initials | | CME | | BSL | | CME | | CME | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | | | |
|-------------|--|--|--|
| Control | | | |
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BPL/AWD/CMP/VKL
IC
 Reviewed by: SS
 Date reviewed: 2019/12/19

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 1st 2019
 Stop Date & Time: June 20th 2019
 Test Species: ~~ONCORHYNCHUS MYKISS~~
Redside shiner

| Concentration STPD-12 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.9 | 14.0 | | | | | | | | | | |
| DO (mg/L) | | 10.1 | 10.2 | 10.2 | 10.0 | | | | | | | | | | |
| pH | | 7.9 | 7.8 | 7.8 | 7.8 | | | | | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | | | | | | | | | | |
| Initials | | CML | | BSL | | | | | | | | | | | |

| Concentration STPD-13 | Days | | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.2 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.8 | 10.1 | 10.0 | 10.0 | 10.1 | | | | | | |
| pH | | 7.9 | 8.0 | 7.8 | 7.8 | 7.9 | 8.0 | 7.9 | 8.0 | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | | | | | | |
| Initials | | CML | | BSL | | CML | | CML | | | | | | | |

| Concentration ERWSF-03 | Days | | | | | | | | | | | | | | |
|---------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | | | | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.9 | | | | | | | | | | |
| pH | | 7.9 | 7.9 | 7.8 | 7.9 | | | | | | | | | | |
| Cond. (µS/cm) | | 334 | | 336 | | | | | | | | | | | |
| Initials | | CML | | BSL | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3
 Analysts: BPL/AWD/cmp/ML/KJL
 Reviewed by: SS
 Date reviewed: 2019/12/19

| | | | | |
|-------------|--|--|--|--|
| Control | | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

Sample Description: _____
 Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 1/2019
 Stop Date & Time: June 27/2019
 Test Species: Round goby

| Concentration STPD-08 | Days | | | | | | | | | | | | | |
|--------------------------|------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.0 | | 10.0 | 10.1 | 10.0 | 9.8 | 10.2 | 10.0 | |
| pH | | | | | | 7.8 | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | | | | | 335 | | 336 | | 338 | | 337 | | |
| Initials | | | | | | BPL | | CML | | CML | | CML | | |

| Concentration STPD-09 | Days | | | | | | | | | | | | | |
|--------------------------|------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.0 | | 10.1 | 10.1 | 10.0 | 9.9 | 10.2 | 10.1 | |
| pH | | | | | | 7.8 | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | | | | | 335 | | 336 | | 338 | | 337 | | |
| Initials | | | | | | BPL | | CML | | CML | | CML | | |

| Concentration STPD-10 | Days | | | | | | | | | | | | | |
|--------------------------|------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.0 | | 10.1 | 10.1 | 10.0 | 9.9 | 10.2 | 10.0 | |
| pH | | | | | | 7.8 | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | | | | | 335 | | 336 | | 338 | | 337 | | |
| Initials | | | | | | BPL | | CML | | CML | | CML | | |

| Concentration STPD-11 | Days | | | | | | | | | | | | | |
|--------------------------|------|-----|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.0 | | 10.1 | 10.0 | 10.0 | 9.8 | 10.2 | 10.0 | |
| pH | | | | | | 7.8 | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | | | | | 335 | | 336 | | 338 | | 337 | | |
| Initials | | | | | | BPL | | CML | | CML | | CML | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond. - 3

Analysts: BPL/ALW/D/CML/KYL

Reviewed by: SS

Date reviewed: 2019/12/18

| | | | |
|-------------|--|--|--|
| Control | | | |
| Hardness* | | | |
| Alkalinity* | | | |

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Tech Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 1, 2019
 Stop Date & Time: June 28, 2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|--|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | | |
| STPD-12 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | | | | | | | 10.1 | 10.2 | 10.0 | 9.9 | 10.2 | 10.1 | | |
| pH | | | | | | | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | | |
| Cond. (µS/cm) | | | | | | | | 336 | | 338 | | 337 | | | |
| Initials | | | | | | | | Cml | | Cml | | Cml | | | |

Hatch day 11

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|---------|-----|-----|--|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | | |
| STPD-13 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | 14.0 | | 14.0 | | | |
| DO (mg/L) | | | | | | | | | | 10.0 | | 10.0 | | | |
| pH | | | | | | | | | | 7.9 | | 7.9 | | | |
| Cond. (µS/cm) | | | | | | | | | | 338 | | 338 | | | |
| Initials | | | | | | | | | | Cml | | Cml/BRL | | | |

Hatch day 12

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|------|-----|------|------|---------|------|---------|------|------|--|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | | |
| ERWSF-03 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | | | | | 10.0 | | 10.1 | 10.1 | 10.0 | 9.9 | 10.1 | 10.0 | | |
| pH | | | | | | 7.8 | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | | | | | 338 | | 336 | | 338 | | 337 | | | |
| Initials | | | | | | BRL | | BRL | | Cml/BRL | | BRL/Cml | | | |

Hatch Day 9

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 7 | | 8 | | | 9 | | 10 | | 11 | | 12 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | | | |
|-------------|--|--|--|
| Control | | | |
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BRL/AWD/Cml/BRL
 Reviewed by: SS
 Date reviewed: 2019/12/19

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teek Coal
 Sample ID: N/A
 Work Order #: N/A

Water

Start Date & Time: June 11/19
 Stop Date & Time: June 20/2015
 Test Species: Redside Darter

| Concentration STPD-08 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | old | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 10.7 | 10.2 | 10.0 | 10.0 | 10.2 | |
| pH | | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | |
| Initials | | CML | | BS | | CML | | CML | | CML | | CML | | |

| Concentration STPD-09 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | old | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 10.1 | 10.0 | 10.1 | |
| pH | | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.8 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | |
| Initials | | CML | | BS | | CML | | CML | | CML | | CML | | |

| Concentration STPD-10 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | old | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 10.2 | 10.0 | 10.1 | |
| pH | | 7.9 | 8.0 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | |
| Initials | | CML | | BS | | CML | | CML | | CML | | CML | | |

| Concentration STPD-11 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | old | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 9.9 | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 9.9 | 10.0 | 10.2 | |
| pH | | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | |
| Initials | | CML | | BS | | CML | | CML | | CML | | CML | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO3

Analysts: BPL/Ans/CML/KL/KSL
 Reviewed by: SS
 Date reviewed: 20191218

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 11/19
 Stop Date & Time: June 20/2017
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| STPD-12 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.1 | 9.9 | 10.0 | 9.8 | 10.1 | 9.9 | 10.6 | 10.1 | 10.2 | 10.1 | 10.0 | 10.2 | | |
| pH | | 7.9 | 7.8 | 7.5 | 7.7 | 7.9 | 8.0 | 7.9 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | | |
| Initials | | Cmf | | Bsu | | Cmf | | Cmf | | Cmf | | Cmf | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| STPD-13 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.9 | 10.1 | 10.1 | 10.0 | 10.2 | 10.2 | 10.1 | 10.0 | 10.1 | | |
| pH | | 7.9 | 8.0 | 7.5 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | | |
| Initials | | Cmf | | Bsu | | Cmf | | Cmf | | Cmf | | Cmf | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|--|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | | |
| ERWSF-03 | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 9.8 | 10.1 | 10.1 | 10.0 | 10.1 | 10.2 | 10.0 | 10.0 | 10.0 | | |
| pH | | 7.9 | 8.0 | 7.5 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | 334 | | 336 | | 337 | | 336 | | 333 | | 334 | | | |
| Initials | | Cmf | | Bsu | | Cmf | | Cmf | | Cmf | | Cmf | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pt1-3 Conductivity meter: cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BPL/AWD/comp/ML
 Reviewed by: SS
 Date reviewed: 2019/12/18

* mg/L as CaCO3

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: NA
 Work Order #: W12

Hatch

Start Date & Time: June 11/19
 Stop Date & Time: July 20/2019
 Test Species: Redside Shiner

| Concentration STPD-08 | Days | | | | | | | | | | | | | |
|--------------------------|---------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | 14.0 | / | / | | | | | | | | | | |
| DO (mg/L) | / | 10.0 | / | / | | | | | | | | | | |
| pH | / | 7.9 | / | / | | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | | | |
| Initials | BFL/JHW | | | | | | | | | | | | | |

| Concentration STPD-09 | Days | | | | | | | | | | | | | |
|--------------------------|---------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | 14.0 | / | / | | | | | | | | | | |
| DO (mg/L) | / | 10.1 | / | / | | | | | | | | | | |
| pH | / | 8.0 | / | / | | | | | | | | | | |
| Cond. (µS/cm) | | 335 | | | | | | | | | | | | |
| Initials | BFL/JHW | | | | | | | | | | | | | |

| Concentration STPD-10 | Days | | | | | | | | | | | | | |
|--------------------------|---------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | 14.0 | / | / | | | | | | | | | | |
| DO (mg/L) | / | 10.2 | / | / | | | | | | | | | | |
| pH | / | 8.0 | / | / | | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | | | |
| Initials | BFL/JHW | | | | | | | | | | | | | |

| Concentration STPD-11 | Days | | | | | | | | | | | | | |
|--------------------------|---------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | / | / | | | | | | | | | | |
| DO (mg/L) | 10.1 | 10.2 | / | / | | | | | | | | | | |
| pH | 7.9 | 8.0 | / | / | | | | | | | | | | |
| Cond. (µS/cm) | | 336 | | | | | | | | | | | | |
| Initials | BFL/JHW | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BFL/AWD/COMP/YM/KOL
 Reviewed by: SS
 Date reviewed: 2019/12/18

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Leek Coal Habitat
 Sample ID: N/A
 Work Order #: 212

Start Date & Time: June 11/19
 Stop Date & Time: June 20/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| STPD-12 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | 14.0 | | | | | | | | | | |
| DO (mg/L) | 10.1 | 10.2 | | 10.0 | | | | | | | | | | |
| pH | 7.9 | 8.0 | | 7.7 | | | | | | | | | | |
| Cond. (µS/cm) | 336 | | 345 | | | | | | | | | | | |
| Initials | BPL/JHW | | BR | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| STPD-13 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | 15.0 | | | | | | | | | | |
| DO (mg/L) | 10.1 | 10.2 | | 10.2 | | | | | | | | | | |
| pH | 7.9 | 8.0 | | 7.9 | | | | | | | | | | |
| Cond. (µS/cm) | 336 | | 346 | | | | | | | | | | | |
| Initials | BPL/JHW | | JHW | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|---------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | | | | | | | | |
| ERWSF-03 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | 14.0 | | | | | | | | | | |
| DO (mg/L) | 10.1 | 10.3 | | 10.0 | | | | | | | | | | |
| pH | 7.9 | 8.0 | | 7.8 | | | | | | | | | | |
| Cond. (µS/cm) | 336 | | 340 | | | | | | | | | | | |
| Initials | BPL/JHW | | BR | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: TA DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

Analysts: BPL/AWD/KMP/ML
 Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Tech coal
 Sample ID: N/A
 Work Order #: N/A

BR

Start Date & Time: June 1/2019
 Stop Date & Time: June 20/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead | |
|---------------|-----|----------------------------------|----|----------------|----------------|----------------|----|----|----|----------------|----------------|----------------|----|--------------------------|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Eggs/Embryos/ Alevins | |
| STPD-08 | 1 | 0 | 0 | | | | | | | | | | | 139 | 26 |
| | 2 | | | | | | | | | | | | | 147 | 52 |
| | 3 | | | | | | | | | | | | | 114 | 80 |
| | 4 | | | | | | | | | | | | | 245 | 37 |
| | 1 | | | | | | | | | | | | | 73 | 64 |
| STPD-08 | 2 | ↓ | ↓ | | | | | | | | | | | 55 | 83 |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| ERWSE-03 | 4 | 0 | 0 | | | | | | | | | | | 141 | 63 |
| STPD-08-B | 1 | | | 2 ⁰ | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 1 ⁰ | 0 | | |
| | 2 | | | 1 ⁰ | 0 | 0 | 0 | 0 | 4 | 0 | 1 ⁰ | 0 | 0 | | |
| | 3 | | | 0 ⁰ | 3 | 1 | 1 | 1 | 3 | 0 | 0 | 0 | 1 | | |
| | 4 | | | | | | | | | | | | | | |
| STPD-09-B | 1 | | | 0 | 1 ⁰ | 0 | 0 | 0 | 0 | 1 ⁰ | 0 | 0 | 0 | | |
| | 2 | | | 1 ⁰ | 1 ⁰ | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | | |
| | 3 | | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | | |
| | 4 | | | | | | | | | | | | | | |
| STPD-10-B | 1 | | | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 3 ⁰ | 1 ⁰ | 0 | | |
| | 2 | | | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | | |
| | 3 | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 1 ⁰ | 0 | 1 | | |
| | 4 | | | | | | | | | | | | | | |
| STPD-11-B | 1 | | | 0 | 0 | | | | | 2 ⁰ | 0 | 0 | 1 | | |
| | 2 | | | 1 | 1 | 1 | 1 | 1 | 1 | 2 ⁰ | 1 ⁰ | 1 | 0 | | |
| | 3 | | | 1 ⁰ | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | | |
| | 4 | | | 0 | 0 | | | | | | | | | | |
| STPD-12-B | 1 | | | 1 ⁰ | 1 | | | | 0 | 0 | 0 | 1 | 1 | | |
| | 2 | | | 1 ⁰ | 1 | | | | | | | 0 | 1 | | |
| | 3 | | | 2 ⁰ | 2 ⁰ | 2 ⁰ | | | | | | 0 | 1 | | |
| | 4 | | | 2 ⁰ | 1 ⁰ | | | | | | | 0 | 1 | | |
| ERWSE-03-B | 1 | | | 0 | 0 | 0 | 0 | | | | | 0 | 0 | | |
| | 2 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | | |
| | 3 | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | | |
| | 4 | | | | | | | | | | | | | | |
| Tech Initials | | MM | BR | BR | CM | BP | BR | BR | BR | BR | BR | BR | BR | | |

Comments: STPD-09 infertilized experiment: 93 eggs all unferf day 2 in 1 also
① unviable
② developed but died prior to hatch No signs of fungus
③ 2 hatch dead (1 deformed 3 Stel, 2 Am, 2 cranio, 2 idema), 1 egg developed but died

Reviewed by: SS Date reviewed: 2019112119

Embryo-Alevin Toxicity Test Daily Mortality

Client: Tock coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BR} June 11/19
 Stop Date & Time: June 20/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|----|----|----|----|----|----|----|----|----|----|---------------------------------|----|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 24 |
| STPD-03-B | 1 | 0 | 0 | 0 | | | | | | | | | | |
| C | 2 | 1 | 1 | 1 | | | | | | | | | | |
| D | 3 | 1 | 1 | 1 | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| STPD-09-B | 1 | 0 | 0 | 0 | | | | | | | | | | |
| C | 2 | 1 | 1 | 1 | | | | | | | | | | |
| D | 3 | 1 | 1 | 1 | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| STPD-10-B | 1 | 0 | 0 | 0 | 1 | | | | | | | | | |
| C | 2 | 1 | 1 | 1 | 0 | | | | | | | | | |
| D | 3 | 1 | 1 | 1 | 0 | | | | | | | | | |
| STPD-11-B | 4 | 1 | 1 | 1 | 1 | | | | | | | | | |
| C | 1 | 1 | 1 | 1 | 1 | | | | | | | | | |
| D | 2 | 1 | 1 | 1 | 1 | | | | | | | | | |
| E | 3 | 1 | 1 | 1 | 1 | | | | | | | | | |
| F | 4 | 1 | 1 | 1 | 0 | | | | | | | | | |
| STPD-12-B | 1 | 1 | 1 | 0 | 0 | | | | | | | | | |
| C | 2 | 1 | 1 | 0 | 0 | | | | | | | | | |
| STPD-B-B | 3 | 1 | 1 | 0 | 0 | | | | | | | | | |
| C | 4 | 1 | 1 | 0 | 0 | | | | | | | | | |
| EWRSF-03-B | 1 | 1 | 1 | 0 | | | | | | | | | | |
| C | 2 | 1 | 1 | 0 | | | | | | | | | | |
| D | 3 | 1 | 1 | 0 | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BR | BR | CM | BR | | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/13/19
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: WIA

Start Date & Time: June 1/2019
 Stop Date: June 20/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|-----|-----|-----|-----|-----|-----|------------------|-----------------|------------------|-----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| STPD-08 | 0 | - | - | - | - | - | - | - | | | | | |
| ↓ 09 | ↓ | - | - | - | - | - | - | - | | | | | |
| ↓ 10 | ↓ | - | - | - | - | - | - | - | | | | | |
| ↓ 11 | ↓ | - | - | - | - | - | - | - | | | | | |
| ↓ 12 | ↓ | - | - | - | - | - | - | - | | | | | |
| ↓ 13 | ↓ | - | - | - | - | - | - | - | | | | | |
| ERWSF-03 | 0 | - | - | - | - | - | - | - | | | | | |
| STPD-08-A | | | | | | | | | 8 ^{FL} | 18 | 7 | 6 | |
| C | | | | | | | | | 25 ^{FL} | 6 | 7 | 1 | |
| D | | | | | | | | | 2 ^{FL} | 4 | 12 ^{FL} | 1 | |
| STPD-09-B | | | | | | | | | 27 ^{FL} | 6 ^{FL} | 1 | 2 | |
| C | | | | | | | | | 0 | 5 | 38 | 4 | |
| D | | | | | | | | | 0 | 4 | 36 | 1 | |
| STPD-10-B | | | | | | | | | 4 ^{FL} | 3 | 1 | 26 | |
| -C | | | | | | | | | 0 | 1 | 18 | 13 | |
| -D | | | | | | | | | 0 | 1 | 1 | 10 | |
| STPD-11-B | | | | | | | | | 0 | 1 | 1 | 6 | |
| -C | | | | | | | | | 6 ^{FL} | 3 | 4 | 13 | |
| -D | | | | | | | | | 6 | 1 | 1 | 13 | |
| -E | | | | | | | | | 0 | 1 | 6 | 4 | |
| -F | | | | | | | | | 0 | 1 | 1 | 6 | |
| STPD-12-B | | | | | | | | | 0 | 1 | 12 | 5 | |
| C | | | | | | | | | 0 | 1 | 1 | 1 | |
| STPD-13-B | | | | | | | | | 0 | 1 | 1 | 14 | |
| -C | | | | | | | | | 0 | 1 | 1 | 1 | |
| ERWSF-03-A | | | | | | | | | 2 | 30 | 13 | 4 | |
| -C | | | | | | | | | 3 | 6 | 21 | 13 | |
| -D | | | | | | | | | 23 | 13 | 3 | 1 | |
| Tech Initials | WV | BL | BSL | BCL | BVL | BPL | BSL | CMP | FL | BL | BPL | CMP | |

Comments:
 ① hatch with don't appear fish formed
 * 3/6 hatch had opaque yolk sacs
 # 2/4 " " " " "
 ② 3/25 " " " " "
 ③ 1/6 " " " " "

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: 5³⁰ June 11/19
 Stop Date: June 20/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|-----|-----|----|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD08-B | 1 | 3 | | | | | | | | | | | |
| C | - | | | | | | | | | | | | |
| D | - | | | | | | | | | | | | |
| STPD09-B | 3 | | | | | | | | | | | | |
| C | 3 | | | | | | | | | | | | |
| D | 6 | | | | | | | | | | | | |
| STPD10-B | 3 | 0 | 0 | 1 | | | | | | | | | |
| C | 12 | 3 | 1 | | | | | | | | | | |
| D | 2 | | | | | | | | | | | | |
| STPD11-B | 36 | 6 | | | | | | | | | | | |
| C | 23 | | | | | | | | | | | | |
| D | 29 | 2 | | | | | | | | | | | |
| E | 32 | 7 | | | | | | | | | | | |
| F | 36 | 2 | 1 | 1 | | | | | | | | | |
| STPD12-B | 28 | 2 | | | | | | | | | | | |
| C | 3 | 17 | | | | | | | | | | | |
| STPD13-B | 21 | | | | | | | | | | | | |
| C | - | 0 | 0 | 1 | | | | | | | | | |
| ERWSFD3-B | - | | | | | | | | | | | | |
| C | 4 | | | | | | | | | | | | |
| D | - | | | | | | | | | | | | |
| Tech Initials | CMP | SS | CMP | CMP | | | | | | | | | |

Comments:

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: PA

Start Date & Time: ^{SR} June 1/2019
 Stop Date: June 20/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | |
|--------------------|--|----|----|----|----|----|----|----|-----|----|----|----|----------|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| STPD-08 | 0 | - | - | - | - | - | - | - | - | | | | | |
| 09 | | - | - | - | - | - | - | - | | | | | | |
| 10 | | - | - | - | - | - | - | - | | | | | | |
| 11 | | - | - | - | - | - | - | - | | | | | | |
| 12 | | - | - | - | - | - | - | - | | | | | | |
| 13 | | - | - | - | - | - | - | - | | | | | | |
| STPD-08 | 0 | - | - | - | - | - | - | - | | | | | | |
| STPD-08-B | | | | | | | | | 1 | 0 | 0 | 0 | | |
| C | | | | | | | | | 1 | 0 | | | | |
| D | | | | | | | | | 1 | 0 | | | | |
| STPD-09-B | | | | | | | | | 1 | 1 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| D | | | | | | | | | 1 | 0 | | | | |
| STPD-10-B | | | | | | | | | 1 | 0 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| D | | | | | | | | | 1 | 0 | | | | |
| STPD-11-B | | | | | | | | | 1 | 0 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| D | | | | | | | | | 1 | 0 | | | | |
| E | | | | | | | | | 1 | 0 | | | | |
| F | | | | | | | | | 1 | 0 | | | | |
| STPD-12-B | | | | | | | | | 1 | 0 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| STPD-13-B | | | | | | | | | 1 | 0 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| BRWSF-08-B | | | | | | | | | 1 | 0 | | | | |
| C | | | | | | | | | 1 | 0 | | | | |
| D | | | | | | | | | 1 | 0 | | | | |
| Tech Initials | MM | BR | BR | BR | BR | BR | BR | BR | CMF | SR | BR | BR | BR | BR |

Comments: _____

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 17 2019
 Stop Date: June 20 2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD-08-B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| STPD-09-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| STPD-10-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| STPD-11-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | |
| STPD-12-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| STPD-13-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| CRWSE-05-B | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| Tech Initials | BSL | BSL | CMP | BSL | CMP | CMP | BSL | BSL | | | | | |

Comments: _____

Embryo-Alevin-Fry Freshwater Toxicity Test

Water Quality Measurements

Client: Teck Coal Embryo
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 4/2019
 Stop Date & Time: June 23/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| STPD-14 | | | | | | | | | | | | | | |
| Temperature (°C) | 9.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.2 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | 10.0 | 9.9 | |
| pH | / | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.8 | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | |
| Cond. (µS/cm) | | 338 | | 336 | | 340 | | 337 | | 339 | | 338 | | |
| Initials | BRL | BRL | | BRL | | BRL | | BRL | | CMP | | BRL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| STPD-15 | | | | | | | | | | | | | | |
| Temperature (°C) | 9.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.2 | 9.9 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 10.0 | 10.0 | 9.9 | |
| pH | / | 7.5 | 7.5 | 7.5 | 7.5 | 7.6 | 7.6 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.9 | |
| Cond. (µS/cm) | | 338 | | 336 | | 340 | | 337 | | 339 | | 338 | | |
| Initials | BRL | BRL | | BRL | | BRL | | BRL | | CMP | | BRL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| STPD-16 | | | | | | | | | | | | | | |
| Temperature (°C) | 9.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.2 | 9.8 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 9.9 | 10.0 | 9.9 | |
| pH | / | 7.5 | 7.6 | 7.5 | 7.5 | 7.6 | 7.5 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.9 | |
| Cond. (µS/cm) | | 338 | | 336 | | 340 | | 337 | | 339 | | 338 | | |
| Initials | BRL | BRL | | BRL | | BRL | | BRL | | CMP | | BRL | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BRL/AWD/CMP/KYL/KSL
 Reviewed by: SS
 Date reviewed: 2019112118

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Leick Coal
 Sample ID: N/A
 Work Order #: N/A

Embryos

Start Date & Time: June 4/2019
 Stop Date & Time: June 23/2019
 Test Species: Redside Shiner

| Concentration STPD-14 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 10.2 | 10.2 | 10.1 | 10.1 | 10.2 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 338 | | 337 | | 334 | | 336 | | 337 | | |
| Initials | | Cmf | | Cmf | | Cmf | | Cmf | | BSC | | Cmf | | |

| Concentration STPD-15 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.0 | 10.0 | 10.1 | 10.2 | 9.9 | 10.2 | 10.2 | 10.0 | 9.9 | 10.1 | 10.0 | |
| pH | | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 336 | | 338 | | 337 | | 334 | | 336 | | 337 | | |
| Initials | | Cmf | | Cmf | | Cmf | | Cmf | | BSC | | Cmf | | |

| Concentration STPD-16 | Days | | | | | | | | | | | | | |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | | 10.1 | 10.2 | 10.0 | 10.0 | 10.2 | 10.0 | 10.1 | 10.2 | 10.0 | 10.0 | 10.1 | 10.0 | |
| pH | | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.8 | 7.9 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 336 | | 338 | | 337 | | 334 | | 336 | | 337 | | |
| Initials | | Cmf | | Cmf | | Cmf | | Cmf | | BSC | | Cmf | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3

pH meter: pH-3

Conductivity meter: Cond. - 3

| | | | | |
|-------------|--------------------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | Control | | | |

Analysts: BPL/AWD/CMP/YR/KL

Reviewed by: SS
 Date reviewed: 2019112105

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo. gr
 Start Date & Time: June 4/19
 Stop Date & Time: June 23/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|--|
| | 13 | | 14 | | 15 | | 16 | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| STPD-14 | | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | | |
| DO (mg/L) | 10.0 | 10.1 | 10.2 | 10.0 | 10.0 | 10.1 | 10.1 | 9.9 | | | | | | | |
| pH | 7.9 | 8.0 | 7.9 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | | | | | | | |
| Cond. (µS/cm) | 336 | | 333 | | 334 | | 336 | | | | | | | | |
| Initials | CML | | CML | | CML | | CML | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-15 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | 10.0 | 10.1 | | | | | | | | | | | | |
| pH | 7.9 | 7.9 | | | | | | | | | | | | |
| Cond. (µS/cm) | 336 | | | | | | | | | | | | | |
| Initials | CML | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-16 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | | | | |
| DO (mg/L) | 10.0 | 10.0 | 10.2 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | | | | | | |
| pH | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | | | | | | |
| Cond. (µS/cm) | 336 | | 330 | | 331 | | 336 | | | | | | | |
| Initials | CML | | CML | | CML | | CML | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|---------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| | Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3
 Analysts: BPL/AND/CMP/YXL/KJL

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO3

Reviewed by: SS
 Date reviewed: 2019112105

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Tech local
 Sample ID: N/A
 Work Order #: N12

Start Date & Time: June 4th/2019
 Stop Date & Time: June 23/2019
 Test Species: Redside shiner

| Concentration <i>STD-14</i> | Days | | | | | | | | | | | | | | |
|--------------------------------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | | | | | | | 10.1 | 10.1 | 10.0 | 9.9 | 10.1 | 10.0 | | |
| pH | | | | | | | | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | | | | | | | 334 | | 336 | | 337 | | | |
| Initials | | | | | | | | CMP | | BPL | | CMP | | | |

| Concentration <i>STD-15</i> | Days | | | | | | | | | | | | | | |
|--------------------------------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | | | | | | | 10.1 | 10.0 | 10.0 | 9.8 | 10.1 | 10.0 | | |
| pH | | | | | | | | 7.9 | 7.8 | 7.8 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | | | | | | | | 334 | | 336 | | 337 | | | |
| Initials | | | | | | | | CMP | | BPL | | CMP | | | |

| Concentration <i>STD-16</i> | Days | | | | | | | | | | | | | | |
|--------------------------------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | | | | | | | 10.1 | 10.2 | 10.0 | 9.8 | 10.1 | 10.0 | | |
| pH | | | | | | | | 7.9 | 7.8 | 7.8 | 7.7 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | | | | | | | 334 | | 336 | | 337 | | | |
| Initials | | | | | | | | CMP | | BPL | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new | |
| Temperature (°C) | | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond.-3
 Analysts: BPL/AMP/CEP/YYL/ESL
 Reviewed by: SS
 Date reviewed: 2019112105

| | | | | |
|-------------|--------------------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | Control | | | |

* mg/L as CaCO3

Sample Description: _____
 Comments: _____

**Embryo-Alevin Fresh-water Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teek Coal
 Sample ID: N/A
 Work Order #: N/A

Hatch ^{GR}
 Start Date & Time: June 4/19
 Stop Date & Time: June 23/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-14 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.5 | 14.5 | 14.0 |
| DO (mg/L) | 10.0 | 10.2 | 10.2 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 | 9.8 | 10.0 | 9.9 |
| pH | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.1 | 7.9 | 7.1 | 7.5 | 7.7 | 7.9 | 7.8 | 7.8 | 7.9 |
| Cond. (µS/cm) | 336 | | 333 | | 334 | | 336 | | 344 | | 350 | | 354 | |
| Initials | CMP | | CMP | | CMP | | CMP | | JLU | | AL | | AM | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-15 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.5 | 14.5 | 14.0 |
| DO (mg/L) | 10.0 | 10.1 | 10.2 | 10.1 | 10.0 | 10.2 | 10.1 | 10.1 | 10.0 | 10.0 | 10.1 | 9.8 | 10.0 | 9.9 |
| pH | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 8.0 | 7.5 | 7.6 | 7.9 | 7.8 | 7.8 | 7.9 |
| Cond. (µS/cm) | 336 | | 333 | | 334 | | 336 | | 344 | | 350 | | 354 | |
| Initials | CMP | | CMP | | CMP | | CMP | | JLU | | AL | | AM | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| STPD-16 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.5 | 14.5 | 14.0 |
| DO (mg/L) | 10.0 | 10.1 | 10.2 | 10.0 | 10.0 | 10.0 | 10.1 | 10.0 | 10.0 | 10.1 | 10.1 | 9.9 | 10.0 | 10.0 |
| pH | 7.9 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 8.0 | 7.5 | 7.6 | 7.9 | 7.8 | 7.8 | 7.9 |
| Cond. (µS/cm) | 336 | | 333 | | 334 | | 336 | | 344 | | 350 | | 354 | |
| Initials | CMP | | CMP | | CMP | | CMP | | JLU | | AL | | AM | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

Analysts: BAL/AND/CMP/MC/KJL

Reviewed by: SS
 Date reviewed: 2019112105

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tox Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 4/2019
 Stop Date & Time: June 23/2019
 Test Species: Redside Shiner

at the coal

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| STPD-14 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | 14.0 | | | | | | | | | | |
| DO (mg/L) | | | | 9.7 | | | | | | | | | | |
| pH | | | | 7.7 | | | | | | | | | | |
| Cond. (µS/cm) | | | 350 | | | | | | | | | | | |
| Initials | | | BPL | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| STPD-15 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | 13.5 | | | | | | | | | | |
| DO (mg/L) | | | | 10.5 | | | | | | | | | | |
| pH | | | | 7.7 | | | | | | | | | | |
| Cond. (µS/cm) | | | 350 | | | | | | | | | | | |
| Initials | | | BPL | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| STPD-16 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | 13.5 | | | | | | | | | | |
| DO (mg/L) | | | | 10.6 | | | | | | | | | | |
| pH | | | | 7.8 | | | | | | | | | | |
| Cond. (µS/cm) | | | 349 | | | | | | | | | | | |
| Initials | | | BPL | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cont.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/AWD/CMP/RYL/K

Reviewed by: SS
 Date reviewed: 2019/12/18

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 4/2019
 Stop Date & Time: June 23/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | | |
|---------------|-----|----------------------------------|-----|-----|----------------|-----|-----|-----|-----|----------------|----------------|----------------|-----|---------------------------------|--------|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Fert | Infert | |
| STPD-14 | 1 | 0 | 0 | | | | | | | | | | | | 180 | 65 |
| STPD-15 | 2 | 0 | 0 | | | | | | | | | | | | 85 | 46 |
| STPD-16 | 3 | 0 | 0 | | | | | | | | | | | | 152 | 172 |
| | 4 | | | | | | | | | | | | | | | |
| STPD-14 B | 1 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 [ⓐ] | 0 | 0 | | | |
| | C | | | | | | | | 0 | 0 | 1 [ⓐ] | 0 | | | | |
| | D | | | | 1 [ⓐ] | | | | | 4 [ⓐ] | 3 [ⓐ] | 0 | | | | |
| | E | | | | 2 [ⓐ] | | | | | 0 | 0 | 0 | | | | |
| STPD-15 B | 1 | | | | 1 [ⓐ] | | | | | 1 [ⓐ] | 3 [ⓐ] | 1 [ⓐ] | | | | |
| | C | | | | 0 | | | | | 0 | 0 | 0 | | | | |
| STPD-16 B | 3 | | | | 1 [ⓐ] | | | | | 2 [ⓐ] | 2 [ⓐ] | 0 | | | | |
| | C | | | | 0 | | | | | 1 [ⓐ] | 2 [ⓐ] | 5 [ⓐ] | 0 | | | |
| | D | | | | 0 | | | | | 0 | 0 | 0 | 0 | | | |
| | E | | | ✓ | 0 | - | - | | | 0 | 0 | 0 | 0 | - | - | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | |
| Tech Initials | | BSL | BSL | BSL | BSL | CMF | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | CMF | |

Comments: ⓐ unviable
ⓑ developed but died, no fungus
ⓒ died during hatch or just after hatch

Reviewed by: SS Date reviewed: 20191125
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Client: Tech Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 4/19
 Stop Date & Time: June 23/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|----|----|----|----|----|----|----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| STPD-14 B | 1 | 0 | | | | | | | | | | | | |
| C | 2 | 0 | 0 | 0 | 0 | | | | | | | | | |
| D | 3 | 0 | | | | | | | | | | | | |
| E | 4 | 1 | | | | | | | | | | | | |
| STPD-15 B | 1 | 0 | | | | | | | | | | | | |
| C | 2 | | | | | | | | | | | | | |
| STPD-16 B | 3 | | | | | | | | | | | | | |
| C | 4 | | | | | | | | | | | | | |
| D | 1 | | | 1 | | | | | | | | | | |
| E | 2 | 1 | 1 | 1 | 1 | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | BS | CM | CM | BS | | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/18
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo ^{BSL}

Client: Tack Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 15/2019
 Stop Date & Time: July 24/2019
 Test Species: Riverside shiner

| Concentration ER-01 | Days | | | | | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 12.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 |
| DO (mg/L) | | 10.1 | 9.9 | 10.0 | 9.8 | 10.2 | 10.1 | 10.0 | 10.1 | 10.1 | 10.0 | 10.0 | 10.0 | 10.1 |
| pH | | 7.9 | 7.6 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | 7.9 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 337 | | 336 | | 333 | | 334 | | 336 | | 344 | | |
| Initials | JRE | CMP | | CMP | | CMP | | CMP | | CMP | | JMW | | BSL |

| Concentration ER-02 | Days | | | | | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | 12.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 |
| DO (mg/L) | | 10.1 | 9.9 | 10.0 | 10.0 | 10.2 | 10.1 | 10.0 | 10.1 | 10.1 | 10.0 | 10.0 | 10.0 | 10.2 |
| pH | | 7.9 | 7.5 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | 7.9 | 7.5 | 7.6 |
| Cond. (µS/cm) | | 337 | | 336 | | 333 | | 334 | | 336 | | 344 | | |
| Initials | JRE | CMP | | CMP | | CMP | | CMP | | CMP | | JMW | | BSL |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | old | new | old | new | old | new | old | new | old | new | old | new | old | new |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: Conna ->

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: JRE CMP JMW
BSL
 Reviewed by: SS
 Date reviewed: 2019112117

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tech Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo

350
 Start Date & Time: June 15/2019
 Stop Date & Time: July 5/2019
 Test Species: Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-01 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.1 | 9.7 | 10.0 | 10.1 | 10.2 | 10.1 | 10.1 | 10.0 | 10.2 | 10.0 | 10.1 | 10.0 | | |
| pH | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | 350 | | 354 | | 347 | | 355 | | 351 | | 353 | | | |
| Initials | AL | | MM | | CMP | | BPL | | CMP | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-02 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 13.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.1 | 9.8 | 10.0 | 10.2 | 10.2 | 10.1 | 10.1 | 9.9 | 10.2 | 10.0 | 10.1 | 10.0 | | |
| pH | 7.9 | 7.7 | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | 350 | | 354 | | 347 | | 355 | | 351 | | 353 | | | |
| Initials | AL | | MM | | CMP | | BPL | | CMP | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: F-7 DO meter: DO-3 pH meter: PH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: RL YLH CMP
BPL
 Reviewed by: SS
 Date reviewed: 2019/12/17

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Texas Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo ^{BR}

Start Date & Time: June 15/2019
 Stop Date & Time: July 4/2019
 Test Species: Oncorhynchus mykiss ^{BR}
Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|-------|------|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-01 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 14.5 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | | | | |
| DO (mg/L) | 10.2 | 10.0 | 9.9 | 9.8 | 9.9 | 9.7 | 10.0 | 9.9 | 10.0 | 10.0 | | | | |
| pH | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | | | | |
| Cond. (µS/cm) | 357 | | 354 | | 355 | | 354 | | 353 | | | | | |
| Initials | CMP | | A | | ~ | | mm | | G CMP | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-02 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | | 10.1 | | | | | | | | | | | | |
| pH | | 8.0 | | | | | | | | | | | | |
| Cond. (µS/cm) | | 352 | | | | | | | | | | | | |
| Initials | CMP | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: CMP AND YFC
CMP
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tech Coal
 Sample ID: N/A
 Work Order #: N/A

Match BR

Start Date & Time: June 15/2019
 Stop Date & Time: July 4/2019
 Test Species: Oncorhynchus mykiss Redside Shiner

| Concentration ER-01 | Days | | | | | | | | | | | | | |
|------------------------|------|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | | | | | 10.2 | | 10.1 | 10.0 | 10.2 | 10.1 | 10.1 | 10.2 | | |
| pH | | | | | 7.9 | | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | | |
| Cond. (µS/cm) | | | | | 347 | | 355 | | 351 | | 353 | | | |
| Initials | | | | | BR | | BR | | CMF | | CMF | | | |

| Concentration ER-02 | Days | | | | | | | | | | | | | |
|------------------------|------|-----|-----|-----|------|-----|------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | | |
| DO (mg/L) | | | | | 10.2 | | 10.1 | 9.8 | 10.2 | 10.0 | 10.1 | 10.2 | | |
| pH | | | | | 7.9 | | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | | |
| Cond. (µS/cm) | | | | | 347 | | 355 | | 351 | | 353 | | | |
| Initials | | | | | BR | | BR | | CMF | | CMF | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | | | | |
|-------------|---------|--|--|--|
| Hardness* | Control | | | |
| Alkalinity* | | | | |

Analysts: BR, CMF
 Reviewed by: SS
 Date reviewed: 2019/12/17

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Hatch

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 15/2019
 Stop Date & Time: July 4/2019
 Test Species: Oncorhynchus mykiss ^{3R}
Reel side stream

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|--------|------|------|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-01 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 14.5 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 13.5 | |
| DO (mg/L) | 10.2 | 10.1 | 9.9 | 9.8 | 9.9 | 9.9 | 10.0 | 10.1 | 10.1 | 10.0 | 10.1 | 10.0 | | |
| pH | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.7 | | |
| Cond. (µS/cm) | 357 | | 354 | | 355 | | 354 | | 353 | | 357 | | 343 | |
| Initials | CMP | | r | | r | | ML | | CMP | | BSC/ML | | /MM | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------|------|------|------|------|------|------|------|-----------|------|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-02 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 14.5 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 10.2 | 10.0 | 9.9 | 9.8 | 9.9 | 9.8 | 10.0 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | | |
| pH | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 7.7 | | |
| Cond. (µS/cm) | 357 | | 354 | | 355 | | 354 | | 353 | | 357 | | 343 | |
| Initials | CMP | | r | | r | | ML | | CMP | | BSC/ML/ML | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: 7-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: CMP AWD VYL
BPL CMP MM
 Reviewed by: SS
 Date reviewed: 2019/12/17

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal Match
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 15/2019
 Stop Date & Time: July 8/2019
 Test Species: Oncorhynchus mykiss Redside Shiner

| Concentration ER-01 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | 10.1 | 10.0 | | | | | | | | | | | | |
| pH | 7.9 | 7.8 | | | | | | | | | | | | |
| Cond. (µS/cm) | 347 | | | | | | | | | | | | | |
| Initials | CMP | | | | | | | | | | | | | |

| Concentration ER-02 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | 10.1 | 9.9 | | | | | | | | | | | | |
| pH | 7.9 | 7.8 | | | | | | | | | | | | |
| Cond. (µS/cm) | 347 | | | | | | | | | | | | | |
| Initials | CMP | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: TA DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: CMP
 Reviewed by: SS
 Date reviewed: 2019/12/29

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Corp
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ¹³⁵ June 15 / 2019
 Stop Date & Time: July 4 / 2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | | | |
|---------------|-----|----------------------------------|-----|-----|-----|-----|-----|---|----|-----|-----|-----|-----|---------------------------------|--------|---|---------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Feet | Unfeet | | |
| EE-01 | 1 | 0 | 0 | | | | | | | | | | | | | | |
| ER-02 | 2 | 1 | 1 | | | | | | | | | | | | | | 188 273 |
| | 3 | | | | | | | | | | | | | | | | 219 89 |
| | 4 | | | | | | | | | | | | | | | | |
| ER-01 | B | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | C | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | D | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | E | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| ER-02 | B | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | C | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | D | | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | E | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| Tech Initials | | CMP | CMP | CMP | CMP | BSR | BSR | A | MM | CMP | BSR | CMP | BSR | | | | |

Comments: Domestic

Reviewed by: SS Date reviewed: 2019/12/19

Embryo-Alevin Toxicity Test Daily Mortality

Client: Tack Cont Start Date & Time: ^{3:00} June 15/2019
 Sample ID: N/A Stop Date & Time: July 4/2019
 Work Order #: N/A Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|-----|----|----|----|-----|-----|-----|----|----|----|----|---------------------------------|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ER-01 | B | 1 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| ER-02 | B | 1 | | | | 0 | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | |
| Tech Initials | | | CMF | r | r | W | CMF | CMF | CMF | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/17
Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 15/2019
 Stop Date: July 4/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|----|----|----|-----|----|----|-------|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ER-01 B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | / |
| C | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| ER-02 B | 1 | | | | | | | | | | | | |
| C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | / |
| D | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| Tech Initials | OML | A | ✓ | W | OMP | BP | BP | _____ | | | | | |

Comments: _____

Embryo-Alevin-Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tecta Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 22, 2019
 Stop Date & Time: July 12, 2019
 Test Species: Oncorhynchus mykiss
the Redside Shiner

| ER-03 Concentration | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.0 | 10.1 | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.0 | |
| pH | / | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 8.0 | 8.0 | 7.9 | |
| Cond. (µS/cm) | / | 354 | | 347 | | 355 | | 351 | | 353 | | 357 | | |
| Initials | JRE | MM | | CMP | | BR | | CMP | | CMP | | CMP | | |

| ER-04 Concentration | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.0 | 10.1 | 10.2 | 10.1 | 10.1 | 10.0 | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.1 | |
| pH | / | 7.8 | 7.8 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.9 | 7.9 | 8.0 | 8.0 | 7.9 | |
| Cond. (µS/cm) | / | 354 | | 347 | | 355 | | 351 | | 353 | | 357 | | |
| Initials | JRE | MM | | CMP | | BR | | CMP | | CMP | | CMP | | |

| ER-05 Concentration | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 12.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | |
| DO (mg/L) | / | 10.0 | 9.9 | 10.2 | 10.0 | 10.1 | 9.9 | 10.2 | 10.1 | 10.1 | 10.0 | 10.2 | 10.0 | |
| pH | / | 7.8 | 7.8 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | 7.9 | |
| Cond. (µS/cm) | / | 354 | | 347 | | 355 | | 351 | | 353 | | 357 | | |
| Initials | JRE | MM | | CMP | | BR | | CMP | | CMP | | CMP | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: JRE YLC
CMP BR
 Reviewed by: SS
 Date reviewed: 2019/12/17

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teds Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo BS

Start Date & Time: June 22/2019
 Stop Date & Time: July 12/2019
 Test Species: Oncorhynchus mykiss
Reasick shrimp

| ER-03 Concentration | Days | | | | | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|----------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 9.8 | 9.7 | 9.8 | 9.9 | 10.0 | 9.9 | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | | |
| pH | 8.0 | 7.9 | 8.0 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | 7.9 | 7.6 | 7.9 | 7.7 | | |
| Cond. (µS/cm) | 354 | | 355 | | 354 | | 353 | | 343 | | 347 | | | |
| Initials | r | | r | | mm | | CMP | | BS/CM/BS | | CMP | | | |

| ER-04 Concentration | Days | | | | | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|----------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 9.8 | 9.8 | 9.8 | 9.8 | 10.0 | 9.9 | 10.1 | 10.0 | 10.1 | 10.1 | 10.1 | 10.0 | | |
| pH | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | | |
| Cond. (µS/cm) | 354 | | 355 | | 354 | | 353 | | 343 | | 347 | | | |
| Initials | r | | r | | mm | | CMP | | BS/CM/BS | | CMP | | | |

| ER-05 Concentration | Days | | | | | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|----------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | 13 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | | |
| DO (mg/L) | 9.8 | 9.8 | 9.8 | 9.8 | 10.0 | 9.8 | 10.1 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | | |
| pH | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.7 | | |
| Cond. (µS/cm) | 354 | | 355 | | 354 | | 353 | | 343 | | 347 | | | |
| Initials | r | | r | | mm | | CMP | | BS/CM/BS | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: 7.9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: AWD YRL CMP
BS
 Reviewed by: SS
 Date reviewed: 2019/12/17

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

BR

Client: Techs Conel
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 22/2019
 Stop Date & Time: July 12/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|--------|------|------|------|------|------|------|------|-----------|------|------|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-03 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.2 | 14.5 | 14.2 | 14.0 | 14.0 | 15.5 | 14.0 | 14.0 | | | |
| DO (mg/L) | 9.9 | 10.0 | 9.8 | 9.7 | 9.8 | 9.7 | 10.0 | 9.9 | 10.2 | 10.3 | 10.2 | | | |
| pH | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 8.0 | 7.8 | 7.8 | | | |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | 350 | | 350 | | | |
| Initials | BR/JMW | | A | | A | | BR/L | | JMW/HM/BR | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|--------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-04 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.2 | 14.5 | 14.2 | 14.0 | 14.0 | 15.5 | | | | | |
| DO (mg/L) | 9.9 | 10.0 | 9.8 | 9.6 | 9.8 | 9.6 | 10.0 | 10.0 | | | | | | |
| pH | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | | | 7.8 | | | |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | | | | | | |
| Initials | BR/JMW | | A | | A | | BR/L | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|--------|------|------|------|------|------|------|------|-----------|------|------|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-05 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 15.0 | 15.0 | 14.2 | 14.5 | 14.2 | 14.0 | 14.0 | 15.5 | 15.0 | 15.0 | | | |
| DO (mg/L) | 9.9 | 10.0 | 9.8 | 9.7 | 9.8 | 9.8 | 10.0 | 9.9 | 10.2 | 10.4 | 10.2 | | | |
| pH | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 8.0 | 8.0 | 7.9 | | | |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | 350 | | 350 | | | |
| Initials | BR/JMW | | A | | A | | BR/L | | JMW/HM/BR | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | | | | | | | | | | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BR JMW AWP
MM
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Hatch

Client: Treck Canal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 22/2019
 Stop Date & Time: July 12/2019
 Test Species: Emcorhynchus mykiss *PC*
Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| <i>ER-03</i> | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | | | | | | | | | | | | | |
| DO (mg/L) | / | | | | | | | | | | | | | |
| pH | / | | | | | | | | | | | | | |
| Cond. (µS/cm) | / | | | | | | | | | | | | | |
| Initials | / | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| <i>ER-04</i> | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | | / | | / | | / | | / | | 14.0 | 14.0 | | |
| DO (mg/L) | / | | / | | / | | / | | / | | 10.1 | 10.0 | | |
| pH | / | | / | | / | | / | | / | | 7.9 | 7.8 | | |
| Cond. (µS/cm) | / | | / | | / | | / | | / | | 347 | | | |
| Initials | / | | / | | / | | / | | / | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| <i>ER-05</i> | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | / | | / | | / | | / | | 14.0 | | 14.0 | 14.0 | | |
| DO (mg/L) | / | | / | | / | | / | | 10.1 | | 10.1 | 10.0 | | |
| pH | / | | / | | / | | / | | 7.9 | | 7.9 | 7.7 | | |
| Cond. (µS/cm) | / | | / | | / | | / | | 343 | | 347 | | | |
| Initials | / | | / | | / | | / | | PC | | CMP | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-1 Conductivity meter: Cond-1

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: PC CMP
 Reviewed by: SS
 Date reviewed: 2019/12/17

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teds Coal
 Sample ID: U/A
 Work Order #: H/A

Hatch

BR
 Start Date & Time: June 22/2019
 Stop Date & Time: July 12/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | | 20 |
|------------------|---------|------|------|------|------|------|------|------|------------|------|--------|------|--------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | | |
| ER-03 | new | old | new | old | new | old | new | old | new | old | new | old | new | old | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 15.5 | 15.0 | 15.0 | 15.0 | 14.5 | 15.0 | 14.0 |
| DO (mg/L) | 9.9 | 9.9 | 9.8 | 9.7 | 9.8 | 9.7 | 10.0 | 9.9 | 10.2 | 10.3 | 10.1 | 10.0 | 10.2 | 10.2 | 10.1 |
| pH | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.6 | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 7.9 | 7.9 | 8.0 | 7.8 |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | 350 | | 350 | | 351 | | 354 |
| Initials | BPL/JMW | | A | | A | | BPL | | BPL/JMW/KH | | JMW/KH | | JMW/KH | | BR |

| Concentration | Days | | | | | | | | | | | | | | 20 |
|------------------|---------|------|------|------|------|------|------|------|------------|------|--------|------|--------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | | |
| ER-04 | new | old | new | old | new | old | new | old | new | old | new | old | new | old | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 15.5 | 14.0 | 15.0 | 14.5 | 15.0 | 14.0 | 14.0 |
| DO (mg/L) | 9.9 | 10.0 | 9.8 | 9.7 | 9.8 | 9.7 | 10.0 | 9.8 | 10.2 | 10.2 | 10.1 | 10.1 | 10.2 | 10.1 | 10.1 |
| pH | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 7.9 | 7.9 | 8.0 | 7.8 |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | 350 | | 350 | | 351 | | 356 |
| Initials | BPL/JMW | | A | | A | | BPL | | BPL/JMW/KH | | JMW/KH | | JMW/KH | | BR |

| Concentration | Days | | | | | | | | | | | | | | 20 |
|------------------|---------|------|------|------|------|------|------|------|------------|------|--------|------|--------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | | |
| ER-05 | new | old | new | old | new | old | new | old | new | old | new | old | new | old | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 15.5 | 14.0 | 15.0 | 14.5 | 15.0 | 15.0 | 14.0 |
| DO (mg/L) | 9.9 | 10.0 | 9.8 | 9.7 | 9.8 | 9.6 | 10.0 | 9.7 | 10.2 | 10.2 | 10.1 | 10.0 | 10.2 | 10.2 | 10.1 |
| pH | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 8.0 | 8.0 | 8.1 | 8.1 | 7.9 | 8.0 | 7.8 |
| Cond. (µS/cm) | 339 | | 347 | | 348 | | 353 | | 350 | | 350 | | 351 | | 356 |
| Initials | BPL/JMW | | A | | A | | BPL | | BPL/JMW/KH | | JMW/KH | | JMW/KH | | BR |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3133 pH meter: pH-1 Conductivity meter: cond-1

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BPL/JMW/KH

Reviewed by: SS
 Date reviewed: 2019/12/19

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Corp
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BCL} June 22/2019
 Stop Date & Time: July 12/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | | | |
|---------------|-----|----------------------------------|-----|-----|-----|----|-----|---|---|----|-----|-----|-----|---------------------------------|--------|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Fert | Unfert | | |
| ER-03 | 1 | 0 | 0 | 0 | | | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 22 | 364 |
| ER-04 | 2 | 0 | 0 | 0 | | | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 117 | 13 |
| ER-05 | 3 | 0 | 0 | 0 | | | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 544 | 168 |
| | 4 | | | | | | | | | | | | | | | | |
| ER-03 B | 1 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 2 | | | | | | 0 | | | | | | | | | | |
| ER-04 B | 3 | | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| ER-05 - B | 3 | | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | | |
| | E | | | | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | | | |
| Tech Initials | | YKL | OMP | BPL | OMP | BR | OMP | A | - | IM | OMP | OMP | OMP | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/17

Embryo-Alevin Toxicity Test Daily Mortality

Embryo

Client: Tech Coad
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 22/2019
 Stop Date & Time: July 2/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|----|----|----|-----|----|----|----|----|----|----|---------------------------------|----|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 24 |
| ER-03 | B | 1 | 1 | 0 | 0 | 0 | 1 | | | | | | | |
| ER-04 | B | 2 | 0 | | | | | | | | | | | |
| | C | 3 | | | | | | | | | | | | |
| | D | 4 | | | | | | | | | | | | |
| ER-05 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | 2 | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | |
| Tech Initials | | SS | A | A | BL | JHW | | | | | | | | |

Comments: 1 developed but died.

Reviewed by: SS Date reviewed: 2019/12/19
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 22/2019
 Stop Date: July 12/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|----|----|-----|-----|----|----|----|----|----|----|----|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ER-03 B | 5 | 0 | 0 | 0 | 0 | | | | | | | | |
| ER-04 B | 6 | 0 | 0 | 0 | | | | | | | | | |
| C | 50 | | | | | | | | | | | | |
| D | 37 | 0 | 2 | 0 | | | | | | | | | |
| ER-05 B | 13 | | | | | | | | | | | | |
| C | 28 | 0 | 1 | 0 | | | | | | | | | |
| D | 37 | | | | | | | | | | | | |
| E | 36 | 0 | 0 | 0 | | | | | | | | | |
| Tech Initials | BCL | A | o | BCL | BCL | | | | | | | | |

Comments:

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Embryo

Client: Tack Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Emmerynchus mykiss ^{BR}
Redside Shiner

| Concentration ER-06 | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.0 | 9.9 | 9.8 | 9.9 | 9.8 | 10.0 | 10.1 | |
| pH | / | 7.9 | 7.8 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | / | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BPL | CMP | | CMP | | CMP | | r | | r | | WM | | |

| Concentration ER-07 | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.0 | 9.9 | 9.9 | 9.9 | 9.9 | 10.0 | 10.0 | |
| pH | / | 7.9 | 7.8 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | / | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BPL | CMP | | CMP | | CMP | | r | | r | | WM | | |

| Concentration ER-08 | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.1 | 10.1 | 10.1 | 10.2 | 10.1 | 9.9 | 9.8 | 9.9 | 9.8 | 10.0 | 10.0 | |
| pH | / | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.9 | |
| Cond. (µS/cm) | / | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BPL | CMP | | CMP | | CMP | | r | | r | | WM | | |

| Concentration ER-09 | Days | | | | | | | | | | | | | |
|------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.1 | 10.1 | 10.0 | 10.2 | 10.1 | 9.9 | 9.8 | 9.9 | 9.9 | 10.0 | 9.9 | |
| pH | / | 7.9 | 7.8 | 7.9 | 7.8 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | / | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BPL | CMP | | CMP | | CMP | | r | | r | | WM | | |

Thermometer: T9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO₃

Analysts: BPL/CMP/YVL

Reviewed by: SS

Date reviewed: 2019/12/11

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Tetra Creek
 Sample ID: N/A
 Work Order #: N/A

Embryo ^{gr}

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss ~~BR~~
Red Sole Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ER-10 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.5 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.0 | 10.2 | 10.1 | 9.8 | 9.7 | 9.8 | 9.9 | 10.0 | 9.9 | |
| pH | / | 7.9 | 7.8 | 7.9 | 8.0 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 351 | | 353 | | 357 | | 359 | | 355 | | 354 | | |
| Initials | BCL | CMP | | CMP | | CMP | | m | | m | | WM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ER-11 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.2 | 10.2 | 10.0 | 9.8 | 9.8 | 9.8 | 9.8 | 10.0 | 9.9 | |
| pH | / | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 8.0 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BCL | CMP | | CMP | | CMP | | m | | m | | WM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ER-12 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.1 | 10.1 | 10.1 | 10.2 | 10.1 | 9.8 | 9.7 | 9.8 | 9.8 | 10.0 | 10.0 | |
| pH | / | 7.9 | 7.9 | 7.8 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 8.0 | 7.9 | 7.9 | 7.8 | |
| Cond. (µS/cm) | | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BCL | CMP | | CMP | | CMP | | m | | m | | WM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ER-13 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.1 | 10.2 | 10.1 | 9.8 | 9.8 | 9.8 | 9.7 | 10.0 | 9.8 | |
| pH | / | 7.9 | 7.9 | 7.9 | 7.9 | 8.0 | 7.8 | 8.0 | 7.9 | 8.0 | 7.8 | 7.9 | 7.9 | |
| Cond. (µS/cm) | | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BCL | CMP | | CMP | | CMP | | m | | m | | WM | | |

Thermometer: T9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

Analysts: BPL/CMP/YL
 Reviewed by: SS
 Date reviewed: 2019/12/11

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Embryo BPL

Client: Tech Coal.
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| ER-14 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | / | 10.2 | 10.0 | 10.1 | 10.1 | 10.2 | 10.0 | 9.8 | 9.9 | 9.8 | 9.9 | 10.0 | 9.9 | |
| pH | / | 7.9 | 7.8 | 7.9 | 7.9 | 8.0 | 7.9 | 8.0 | 7.9 | 8.0 | 8.0 | 7.9 | 7.8 | |
| Cond. (µS/cm) | / | 351 | | 353 | | 357 | | 354 | | 355 | | 354 | | |
| Initials | BPL | CMP | | CMP | | CMP | | r | | r | | UM | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | / | | | |
| Alkalinity* | / | | | |

* mg/L as CaCO3

Analysts: BPL/CMP/YVL

Reviewed by: SS

Date reviewed: 2019/12/11

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teck Coal
 Sample ID: UFA
 Work Order #: N/A

Start Date & Time: June 25/19
 Stop Date & Time: July 15/2019
 Test Species: Gambusia affinis
Redside shiner

| Concentration ER-06 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-------------|------|------|------|---------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 10.0 | 9.9 | 9.8 | 9.9 | 9.7 | 9.8 | 9.6 | | |
| pH | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BSL/CMP/MLL | | CMP | | BSL/JHL | | A | | A | | | |

| Concentration ER-07 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-------------|------|------|------|---------|------|------|------|------|-----|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.8 | 9.8 | 9.7 | | |
| pH | 7.9 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.7 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BSL/CMP/MLL | | CMP | | BSL/JHL | | A | | A | | | |

| Concentration ER-08 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-------------|------|------|------|---------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 10.0 | 10.1 | 10.0 | 9.9 | 10.0 | 9.8 | 9.8 | 9.8 | 9.8 | | |
| pH | 7.9 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | 7.8 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BSL/CMP/MLL | | CMP | | BSL/JHL | | A | | A | | | |

| Concentration ER-09 | Days | | | | | | | | | | | | | |
|------------------------|------|------|-------------|------|------|------|---------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.1 | 10.1 | 9.9 | 10.1 | 9.9 | 9.9 | 10.0 | 9.8 | 9.8 | 9.8 | 9.6 | | |
| pH | 7.9 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.7 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BSL/CMP/MLL | | CMP | | BSL/JHL | | A | | A | | | |

Thermometer: TS-9 DO meter: 110-3 pH meter: pH-3 Conductivity meter: pH-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BSL/CMP/YXL/MLL/JM-
 Reviewed by: SS
 Date reviewed: 2019/12/11

* mg/L as CaCO3

Sample Description: _____

Comments: _____

**Embryo-Alevin Freshwater Toxicity Test
Initial and Final Water Quality Measurements**

Client: Teek Coal
 Sample ID: N/A
 Work Order #: N/A

Embryo
 Start Date & Time: June 25/19
 Stop Date & Time: July 15 2019
 Test Species: Oncorhynchus mykiss CP
Redside Shiner

| Concentration ER-10 | Days | | | | | | | | | | | | | | |
|------------------------|------|------|----------|------|------|------|--------|------|------|------|------|------|------|-----|--|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.8 | 10.1 | 9.9 | 9.9 | 9.9 | 9.8 | 9.7 | 9.8 | 9.8 | 9.8 | | |
| pH | 7.9 | 7.9 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | | |
| Initials | CMP | | BZ/AM/AM | | CMP | | BS/JMK | | A | | A | | | | |

| Concentration ER-11 | Days | | | | | | | | | | | | | |
|------------------------|------|------|----------|------|------|------|--------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.8 | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.9 | 9.8 | 9.8 | | |
| pH | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.6 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BZ/AM/AM | | CMP | | BS/JMK | | A | | A | | | |

| Concentration ER-12 | Days | | | | | | | | | | | | | |
|------------------------|------|------|----------|------|------|------|--------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.8 | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.7 | 9.8 | 9.8 | | |
| pH | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BZ/AM/AM | | CMP | | BS/JMK | | A | | A | | | |

| Concentration ER-13 | Days | | | | | | | | | | | | | |
|------------------------|------|------|----------|------|------|------|--------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.6 | 9.8 | 9.7 | | |
| pH | 7.9 | 7.8 | 7.9 | 7.7 | 7.9 | 7.8 | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 347 | | 348 | | | |
| Initials | CMP | | BZ/AM/AM | | CMP | | BS/JMK | | A | | A | | | |

Thermometer: TC-10 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BP/CMP/YKL/MN/JMV
 Reviewed by: SS
 Date reviewed: 2019/12/11

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/19
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss CP
Redside Shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|---------|------|------|------|---------|------|------|------|------|------|-----|-----|
| | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | new | old |
| ER-14 | new | old | new | old | new | old | new | old | new | old | new | old | | |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.0 | 14.5 | 14.0 | | |
| DO (mg/L) | 10.1 | 10.1 | 10.1 | 9.8 | 10.1 | 9.9 | 9.9 | 9.8 | 9.8 | 9.8 | 9.8 | 9.7 | | |
| pH | 7.9 | 7.9 | 7.9 | 7.7 | 7.9 | 7.7 | 7.8 | 7.6 | 7.8 | 7.8 | 7.8 | 7.7 | | |
| Cond. (µS/cm) | 353 | | 343 | | 347 | | 339 | | 342 | | 348 | | | |
| Initials | CMB | | BCK/MLW | | CMB | | BSL/MLW | | A | | A | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

Thermometer: 55-7.9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BAE/MD/YYL/AM/JMW
 Reviewed by: SS
 Date reviewed: 2019/12/11

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

Client: Peek
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-06 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | | | | | | | | | | |
| DO (mg/L) | 10.0 | 10.0 | 10.2 | 10.2 | | | | | | | | | | |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | | | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | | | | | | | | | | |
| Initials | BR | | BR/JMW/HM | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----------|------|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-07 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | 15.0 | 15.0 | | | | | | | | |
| DO (mg/L) | 10.0 | 10.0 | 10.2 | 10.2 | 10.1 | 10.2 | | | | | | | | |
| pH | 7.8 | 7.8 | 8.0 | 8.0 | 8.1 | 8.1 | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | | | | | | | | |
| Initials | BR | | BR/JMW/HM | | JMW/HM | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----------|------|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-08 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.5 | | | | | | | | |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.3 | 10.1 | 10.3 | | | | | | | | |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 8.1 | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | | | | | | | | |
| Initials | BR | | BR/JMW/HM | | JMW/HM | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-09 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | 10.0 | 9.9 | | | | | | | | | | | | |
| pH | 7.8 | 7.9 | | | | | | | | | | | | |
| Cond. (µS/cm) | 353 | | | | | | | | | | | | | |
| Initials | BR | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | | |
|-------------|---------|--|--|--|
| | Control | | | |
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO₃

Analysts: BR JMW HM

Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

SR
 Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-10 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 14.0 | 14.0 | 15.0 | 14.5 | | | | | | | | |
| DO (mg/L) | 10.0 | 9.8 | 10.2 | 10.3 | 10.1 | 10.2 | | | | | | | | |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 8.1 | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | | | | | | | | |
| Initials | BCL | | BCL/JHW/HM | | JHW/HM | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-11 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | | | | | | | | | | |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.3 | | | | | | | | | | |
| pH | 7.8 | 7.9 | 8.0 | 7.8 | | | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | | | | | | | | | | |
| Initials | BCL | | BCL/JHW/HM | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-12 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | 15.0 | 14.5 | | | | | | | | |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.3 | 10.1 | 10.2 | | | | | | | | |
| pH | 7.8 | 7.9 | 8.0 | 8.0 | 8.1 | 8.1 | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | | | | | | | | |
| Initials | BCL | | BCL/JHW/HM | | JHW/HM | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| ER-13 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | | | | | | | | | | | | |
| DO (mg/L) | 10.0 | 9.8 | | | | | | | | | | | | |
| pH | 7.8 | 7.8 | | | | | | | | | | | | |
| Cond. (µS/cm) | 353 | | | | | | | | | | | | | |
| Initials | BCL | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | | | |
|-------------|---------|--|--|
| | Control | | |
| Hardness* | | | |
| Alkalinity* | | | |

Analysts: BCL JHW/HM
 Reviewed by: SS
 Date reviewed: 2019/12/19

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Embryo

Client: TECK
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 15^{3:15} 2019
 Stop Date & Time: July 15^{8:00} 2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-14 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 5.0 15.0 | 15.0 | | | | | | | | | | |
| DO (mg/L) | 10.0 | 9.8 | 10.2 | 10.2 | | | | | | | | | | |
| pH | 7.8 | 7.9 | 8.0 | 8.0 | | | | | | | | | | |
| Cond. (µS/cm) | 353 | | 350 | | | | | | | | | | | |
| Initials | BRL | | SS/JMW/MM | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-3 pH meter: pH-3 Conductivity meter: cond-3

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO3

Analysts: BRL JMW MM

Reviewed by: SS

Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Texas Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss ^{BR}
Redside shiner

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|---|--|--------|--|------|--|------|--|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ER-06 | | | | | | | | | | | | | |
| Temperature (°C) | | | | 14.0 | | 14.0 | | 14.0 | | 15.0 | 14.0 | 14.5 | 14.0 |
| DO (mg/L) | | | | 10.1 | | 10.1 | | 9.9 | | 9.8 | 9.7 | 9.8 | 9.6 |
| pH | | | | 7.9 | | 7.9 | | 7.8 | | 7.8 | 7.8 | 7.8 | 7.7 |
| Cond. (µS/cm) | | | | 343 | | 347 | | 339 | | 347 | | 348 | |
| Initials | | | | BR/AMP | | AMP | | BR | | AMP | | AMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|---|--|--------|--|---|--|------|--|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ER-07 | | | | | | | | | | | | | |
| Temperature (°C) | | | | 14.0 | | | | 14.0 | | 15.0 | 14.0 | 14.5 | 14.0 |
| DO (mg/L) | | | | 10.1 | | | | 9.9 | | 9.8 | 9.7 | 9.8 | 9.8 |
| pH | | | | 7.9 | | | | 7.8 | | 7.8 | 7.8 | 7.8 | 7.7 |
| Cond. (µS/cm) | | | | 343 | | | | 339 | | 347 | | 348 | |
| Initials | | | | BR/AMP | | | | BR | | AMP | | AMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|---|--|--------|--|---|--|------|--|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ER-08 | | | | | | | | | | | | | |
| Temperature (°C) | | | | 14.0 | | | | 14.0 | | 15.0 | 14.0 | 14.5 | 14.0 |
| DO (mg/L) | | | | 10.1 | | | | 9.9 | | 9.8 | 9.7 | 9.8 | 9.7 |
| pH | | | | 7.9 | | | | 7.8 | | 7.8 | 7.8 | 7.8 | 7.7 |
| Cond. (µS/cm) | | | | 343 | | | | 339 | | 347 | | 348 | |
| Initials | | | | BR/AMP | | | | BR | | AMP | | AMP | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|---|--|--------|--|---|--|------|--|------|------|------|------|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | |
| ER-09 | | | | | | | | | | | | | |
| Temperature (°C) | | | | 14.0 | | | | 14.0 | | 15.0 | 14.0 | 14.5 | 14.0 |
| DO (mg/L) | | | | 10.1 | | | | 9.9 | | 9.8 | 9.7 | 9.8 | 9.7 |
| pH | | | | 7.9 | | | | 7.8 | | 7.8 | 7.8 | 7.8 | 7.7 |
| Cond. (µS/cm) | | | | 343 | | | | 339 | | 347 | | 348 | |
| Initials | | | | BR/AMP | | | | BR | | AMP | | AMP | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: COND-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BR AMP AMP
 Reviewed by: SS
 Date reviewed: 20191211

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Hatch

Client: Tech Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss ^{BS}
Residue Shiner

| Concentration ER-10 | Days | | | | | | | | | | | | | |
|------------------------|-------|-----|-----|--------|-----|------|------|--------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | | | | 10.1 | | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.8 | 9.8 | 9.7 | |
| pH | | | | 7.9 | | 7.9 | 7.8 | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | | | 343 | | 347 | | 339 | | 342 | | 348 | | |
| Initials | | | | BS/JMW | | CMP | | BS/JMW | | A | | A | | |

| Concentration ER-11 | Days | | | | | | | | | | | | | |
|------------------------|-------|-----|-----|--------|-----|------|------|--------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | 14.0 | |
| DO (mg/L) | | | | 10.1 | | 10.1 | 10.0 | 9.9 | 9.9 | 9.8 | 9.7 | 9.8 | 9.7 | |
| pH | | | | 7.9 | | 7.9 | 7.8 | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | | | 343 | | 347 | | 339 | | 347 | | 348 | | |
| Initials | | | | BS/JMW | | CMP | | BS/JMW | | A | | A | | |

| Concentration ER-12 | Days | | | | | | | | | | | | | |
|------------------------|-------|-----|-----|--------|-----|------|------|--------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 15.0 | 14.0 | |
| DO (mg/L) | | | | 10.1 | | 10.1 | 9.9 | 9.9 | 9.9 | 9.8 | 9.7 | 9.8 | 9.7 | |
| pH | | | | 7.9 | | 7.9 | 7.8 | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | | | 343 | | 347 | | 339 | | 347 | | 348 | | |
| Initials | | | | BS/JMW | | CMP | | BS/JMW | | A | | A | | |

| Concentration ER-13 | Days | | | | | | | | | | | | | |
|------------------------|-------|-----|-----|--------|-----|------|------|--------|------|------|------|------|------|--|
| | init. | 7 | | 8 | | 9 | | 10 | | 11 | | 12 | | |
| | | new | old | new | old | new | old | new | old | new | old | new | old | |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.5 | 14.0 | |
| DO (mg/L) | | | | 10.1 | | 10.1 | 9.9 | 9.9 | 9.9 | 9.8 | 9.6 | 9.8 | 9.7 | |
| pH | | | | 7.9 | | 7.9 | 7.9 | 7.8 | 7.3 | 7.8 | 7.8 | 7.8 | 7.7 | |
| Cond. (µS/cm) | | | | 343 | | 347 | | 339 | | 347 | | 348 | | |
| Initials | | | | BS/JMW | | CMP | | BS/JMW | | A | | A | | |

Thermometer: T-9 DO meter: D-3 pH meter: pH-3 Conductivity meter: Cond.-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

Analysts: BS AMP AND JMW
 Reviewed by: BS
 Date reviewed: 20191211

* mg/L as CaCO3

Sample Description: _____

Comments: _____

Embryo-Alevin Freshwater Toxicity Test Initial and Final Water Quality Measurements

Client: Teds Coal Hatch
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Oncorhynchus mykiss ^{BC}
Redside shiner

| Concentration EP-14 | Days | | | | | | | | | | | | |
|------------------------|-------|-----|-----|------|-----|------|------|--------|------|------|------|------|------|
| | 7 | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | 14.0 | | 14.0 | 14.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.0 | 14.0 |
| DO (mg/L) | | | | 10.1 | | 10.1 | 10.0 | 9.9 | 9.8 | 9.8 | 9.7 | 9.8 | 9.7 |
| pH | | | | 7.9 | | 7.9 | 7.8 | 7.8 | 7.4 | 7.8 | 7.8 | 7.8 | 7.7 |
| Cond. (µS/cm) | | | | 343 | | 347 | | 359 | | 347 | | 348 | |
| Initials | | | | AKM | | CMF | | BR/SMW | | A | | A | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | |
|------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | init. | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | |

Thermometer: T-9 DO meter: DO-3 pH meter: pH-3 Conductivity meter: Cond-3

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BR/CMF/SMW
AWP
 Reviewed by: SS
 Date reviewed: 2019/12/11

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Hatch

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ER-06 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.5 | 15.0 | 14.5 | 14.0 | 14.0 | 14.5 | 14.0 | 15.0 | 10.0 |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.2 | 10.1 | 10.0 | 10.2 | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 8.0 | 8.1 | 8.0 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MM | |

20 old
15.1
10.2
7.9
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ER-07 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 15.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.2 | 10.1 | 10.2 | 10.2 | 10.2 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 7.9 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MM | |

20 old
15.0
10.2
7.9
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ER-08 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 15.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.8 | 10.2 | 10.2 | 10.1 | 10.1 | 10.2 | 10.0 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 7.9 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MM | |

20 old
15.0
10.2
8.0
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ER-09 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 14.0 | 14.0 | 14.5 | 14.0 | 15.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.8 | 10.5 | 10.0 | 10.1 | 10.3 | 10.2 | 10.2 | 10.0 | 10.1 | 9.9 | 10.0 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 7.9 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MM | |

20 old
15.0
10.1
7.9
350
CM

DO meter: DO-35 JHW pH meter: pH-35 JHW Conductivity meter: Cond-35 JHW

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BRL/CMP/JHW/MM/JHW
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Eck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-10 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | 15.0 | 14.0 | 15.0 | 14.5 | 14.0 | 14.0 | 14.5 | 14.0 | 13.0 | 14.0 |
| DO (mg/L) | 10.0 | 9.8 | 10.2 | 10.2 | 10.1 | 10.1 | 10.2 | 10.0 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 10.0 |
| pH | 7.8 | 7.9 | 8.0 | 8.0 | 8.1 | 8.0 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.1 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MLG | |

Old
20
15.0
10.2
7.9
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-11 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 15.0 | 15.0 | 15.0 | 15.0 | 14.5 | 14.0 | 14.0 | 14.5 | 14.0 | 15.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.7 | 10.2 | 10.3 | 10.1 | 10.1 | 10.2 | 9.9 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 9.9 |
| pH | 7.8 | 7.8 | 8.0 | 8.0 | 8.1 | 8.0 | 7.9 | 7.9 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MLG | |

20
old
15.0
10.1
7.9
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-12 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.5 | 15.0 | 14.5 | 14.0 | 14.0 | 14.5 | 14.0 | 13.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.8 | 10.2 | 10.2 | 10.1 | 10.2 | 10.2 | 10.1 | 10.0 | 10.1 | 9.9 | 10.0 | 9.9 | 9.9 |
| pH | 7.8 | 7.9 | 8.0 | 7.9 | 8.1 | 8.0 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.9 | 8.0 | 8.1 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MLG | |

20
old
15.0
9.8
7.9
350
CM

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| ER-13 | | | | | | | | | | | | | | |
| Temperature (°C) | 14.0 | 14.0 | 15.0 | 14.0 | 15.0 | 14.0 | 15.0 | 15.0 | 14.0 | 14.0 | 14.5 | 14.0 | 13.0 | 13.0 |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.2 | 10.1 | 10.2 | 10.2 | 10.1 | 10.0 | 10.1 | 9.9 | 10.1 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 8.0 | 8.1 | 8.0 | 7.9 | 8.1 | 7.8 | 7.8 | 7.7 | 7.9 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 359 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BRL | | BRL/JHW/MM | | JHW/MM | | JHW/MM | | BRL | | MM | | MLG | |

20
old
15.0
9.9
7.9
350
CM

DO meter: D-35 pH meter: pH-35 Conductivity meter: cond-35

| | Control | | |
|-------------|---------|--|--|
| Hardness* | | | |
| Alkalinity* | | | |

* mg/L as CaCO3

Analysts: BRL/CMO/YYL/MM/JHW
 Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin-Fry Toxicity Test Water Quality Measurements

Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|------|------------|------|--------|------|--------|------|------|------|------|------|------|------|
| | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | |
| ER-14 | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | 14.0 | 14.0 | 15.5 | 14.0 | 15.0 | 14.0 | 15.0 | 14.5 | 14.0 | 14.0 | 14.5 | 14.0 | 19.0 | 15.0 |
| DO (mg/L) | 10.0 | 9.9 | 10.2 | 10.0 | 10.1 | 10.2 | 10.2 | 10.1 | 10.0 | 10.1 | 9.9 | 10.2 | 9.9 | 10.0 |
| pH | 7.8 | 7.8 | 8.0 | 7.9 | 8.1 | 8.0 | 7.9 | 8.0 | 7.8 | 7.8 | 7.7 | 7.8 | 8.0 | 8.0 |
| Cond. (µS/cm) | 353 | | 350 | | 350 | | 351 | | 349 | | 349 | | 346 | |
| Initials | BPL | | BPL/JHL/HH | | JHL/HH | | JHL/HH | | BPL | | HH | | ML | |

ok
 20
 150
 9.9
 8.2
 350
 CML

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

| Concentration | Days | | | | | | | | | | | | | |
|------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | new | old | new | old | new | old | new | old | new | old | new | old | new | old |
| Temperature (°C) | | | | | | | | | | | | | | |
| DO (mg/L) | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | |
| Cond. (µS/cm) | | | | | | | | | | | | | | |
| Initials | | | | | | | | | | | | | | |

DO meter: DO-B5 JHL pH meter: pH-B5 JHL Conductivity meter: Cond-B5 JHL

| | Control | | | |
|-------------|---------|--|--|--|
| Hardness* | | | | |
| Alkalinity* | | | | |

* mg/L as CaCO3

Analysts: BPL/CMP/YL/HH/JHL

Reviewed by: SS
 Date reviewed: 2019/12/19

Sample Description: _____

Comments: _____

Embryo-Alevin Toxicity Test Daily Mortality

Client: Texas Coal.
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25 2019
 Stop Date & Time: July 15 2019
 Test Species: Redside shiner

→ See other page.

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|----------------------|-----|----------------------------------|-----|----|---|---|---|---|---|---|----|----|----|---------------------------------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Count | Value |
| ER-06 | 1 | 0 | 6 | 0 | 0 | | | | | | | | | 163 | 99 |
| -07 | 2 | | | | | | | | | | | | | 360 | 111 |
| -08 | 3 | | | | | | | | | | | | | 333 | 100 |
| -09 | 4 | | | | | | | | | | | | | 407 | 72 |
| -10 | 1 | | | | | | | | | | | | | 183 | 140 |
| -11 | 2 | | | | | | | | | | | | | 285 | 41 |
| -12 | 3 | | | | | | | | | | | | | 442 | 96 |
| -13 | 4 | | | | | | | | | | | | | 405 | 71 |
| -14 | 1 | | | | | | | | | | | | | 361 | 118 |
| ER-06 - B | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| ER-07 - B | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| ER-08 - C | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| | 1 | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | |
| | 3 | | | | | | | | | | | | | | |
| | 4 | | | | | | | | | | | | | | |
| Tech Initials | | BS | BSL | SL | r | d | | | | | | | | | |

BSL

↑

Comments: _____

Reviewed by: SS Date reviewed: 2019/07/12/11
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal. Start Date & Time: ^{5^{PM}} June 25/2019
 Sample ID: N/A Stop Date & Time: July 15/2019
 Work Order #: N/A Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins |
|---------------|-----|----------------------------------|----|----|----|---|---|----|-----|-----|-----|----|----|---------------------------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ER-06 | B | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 ^{PM} 2 ⁰ |
| | C | 2 | | | | | | | | | | | | 0 |
| | D | 3 | | | | | | | | | | | | 3 |
| | E | 4 | | | | | | | | | | | | 0 |
| ER-07 | B | 1 | | | | | | | | | 0 | | | 5 ^{PM} 3 ⁰ |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | 5 ^{PM} 1 ⁰ |
| | E | 4 | | | | | | | | | | | | 1 ⁰ |
| ER-08 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| ER-09 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| ER-10 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | 5 ^{PM} 1 ⁰ |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | 5 ^{PM} 1 ⁰ |
| ER-11 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| ER-12 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| ER-13 | B | 1 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | |
| Tech Initials | | | BS | BS | BS | - | - | WR | CMF | CMF | CMF | BS | A | BS |

Comments: ① Developed but died before hatch.
② 2 developed but died before hatch. In relation to ...

Reviewed by: SS Date reviewed: 2019/12/11
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck Coal
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------------------------|--|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | |
| ER-14 | B | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | C | 2 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| | D | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| | E | 4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | | |
| | | 1 | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | |
| | | 1 | | | | | | | | | | | | | |
| | | 2 | | | | | | | | | | | | | |
| | | 3 | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | |
| Tech Initials | | | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | BSL | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/11
Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BR} June 25/2019
 Stop Date & Time: July 15/2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|----------------|----|-----|-----|----|----|----|----|----|----|----|---------------------------------|--|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | |
| ER-6 | B | 1 | 0 | | | | | | | | | | | | |
| | C | 2 | 1 | | | | | | | | | | | | |
| | D | 3 | | 1 | | | | | | | | | | | |
| | E | 4 | 1 | | | | | | | | | | | | |
| ER-7 | B | 1 | 0 | | | | | | | | | | | | |
| | C | 2 | 2 [Ⓞ] | 2 | | | | | | | | | | | |
| | D | 3 | 1 [Ⓞ] | 0 | 0 | 2 | | | | | | | | | |
| | E | 4 | 0 [Ⓞ] | 0 | 0 | 3 | | | | | | | | | |
| ER-8 | B | 1 | 0 | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| ER-9 | B | 1 | | | | | | | | | | | | | |
| | C | 2 | 1 [Ⓞ] | | | | | | | | | | | | |
| | D | 3 | 0 | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| ER-10 | B | 1 | | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | | |
| | D | 3 | | 3 | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| ER-11 | B | 1 | | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| ER-12 | B | 1 | | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| ER-13 | B | 1 | | | | | | | | | | | | | |
| | C | 2 | | | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | | |
| | E | 4 | | | | | | | | | | | | | |
| Tech Initials | | | BR | BR | JLL | JLL | | | | | | | | | |

Comments: Ⓞ Hatched, technician error
Ⓞ developed but died

Reviewed by: SS Date reviewed: 2019112119
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin Toxicity Test Daily Mortality

Client: Tecol
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BR} June 25 / 2019
 Stop Date & Time: July 15 / 2019
 Test Species: Redside shiner

| Concentration | Rep | Day of Test - No. of Mortalities | | | | | | | | | | | | Total Dead Eggs/Embryos/Alevins | |
|---------------|-----|----------------------------------|-------|------------------|----|----|----|----|----|----|----|----|----|---------------------------------|--|
| | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | |
| ER-14 | B | 1 | 0 | _____ | | | | | | | | | | | |
| | C | 2 | 1 | _____ | | | | | | | | | | | |
| | D | 3 | 1 | _____ | | | | | | | | | | | |
| | E | 4 | 1 | _____ | | | | | | | | | | | |
| | 1 | | | _____ | | | | | | | | | | | |
| | 2 | | | _____ | | | | | | | | | | | |
| | 3 | | | _____ | | | | | | | | | | | |
| | 4 | | | _____ | | | | | | | | | | | |
| | 1 | | | _____ | | | | | | | | | | | |
| | 2 | | | _____ | | | | | | | | | | | |
| | 3 | | | _____ | | | | | | | | | | | |
| | 4 | | | _____ | | | | | | | | | | | |
| | 1 | | | _____ | | | | | | | | | | | |
| | 2 | | | _____ | | | | | | | | | | | |
| | 3 | | | _____ | | | | | | | | | | | |
| | 4 | | | _____ | | | | | | | | | | | |
| | 1 | | | _____ | | | | | | | | | | | |
| | 2 | | | _____ | | | | | | | | | | | |
| | 3 | | | _____ | | | | | | | | | | | |
| | 4 | | | _____ | | | | | | | | | | | |
| | 1 | | | _____ | | | | | | | | | | | |
| | 2 | | | _____ | | | | | | | | | | | |
| | 3 | | | _____ | | | | | | | | | | | |
| | 4 | | | _____ | | | | | | | | | | | |
| Tech Initials | | | BR BR | | | | | | | | | | | | |

Comments: _____

Reviewed by: SS Date reviewed: 2019/12/11
 Version 1.1 Issued October 6, 2015 Nautilus Environmental Company Inc.

Embryo-Alevin-Fry Test Daily Hatch Mortality ~~BR~~

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BR} June 25/2019
 Stop Date: July 15/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) ^{BR} Hatch | | | | | | | | | | | | Comments |
|---------------|--|---|---|---|---|---|---|-----|-----|------------------|----|------------------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ER-06 B | | | | | | | | - | - | 48 | 0 | 1 | |
| C | | | | | | | | - | - | 46 | 1 | 3 | |
| D | | | | | | | | - | - | 45 34 | | 1 | |
| E | | | | | | | | - | - | 11 | | 0 | |
| ER-07 B | | | | | | | | - | - | 44 | | 1 | |
| C | | | | | | | | - | - | 34 34 | | 1 | |
| D | | | | | | | | - | - | 7 | | 2 | |
| E | | | | | | | | - | - | | | 6 | |
| ER-08 B | | | | | | | | - | - | 40 | | 5 | |
| C | | | | | | | | - | - | 35 34 | | 2 | |
| D | | | | | | | | - | - | 4 | | 12 | |
| E | | | | | | | | - | - | | | 4 | |
| ER-09 B | | | | | | | | - | - | 38 | | 19 | |
| C | | | | | | | | - | - | 1 | | 31 | |
| D | | | | | | | | - | - | 36 36 | | 4 | |
| E | | | | | | | | - | - | 29 | | 16 | |
| ER-10 B | | | | | | | | - | 4 | 34 34 | | 3 | |
| C | | | | | | | | - | - | 38 38 | | 1 | |
| D | | | | | | | | 2 | - | 22 | | 4 | |
| E | | | | | | | | - | - | | | 26 | |
| ER-11 B | | | | | | | | - | - | | | 47 | |
| C | | | | | | | | - | - | | | 24 | |
| D | | | | | | | | 2 | - | | | 22 | |
| E | | | | | | | | - | - | | | 45 | |
| ER-12 B | | | | | | | | 7 | 15 | 32 | | 0 | |
| C | | | | | | | | - | - | | | 27 | |
| D | | | | | | | | 5 | - | 1 | | 35 | |
| E | | | | | | | | - | - | 1 | | 44 | |
| ER-13 B | | | | | | | | 5 | 11 | 22 | | 3 | |
| C | | | | | | | | - | - | 33 | | 13 | |
| D | | | | | | | | 10 | - | 11 | | 7 | |
| E | | | | | | | | - | - | 4 | | 23 23 | |
| Tech Initials | | | | | | | | cmp | cmp | BR | a | BR | |

Comments: _____

Embryo-Alevin-Fry Test Daily Hatch

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{GR} Jul Same 25/2019
 Stop Date: July 15/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of hatch | | | | | | | | | | | | Comments |
|---------------|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| ER-06 B | - | - | - | - | - | - | - | - | - | - | - | - | |
| C | - | - | - | - | - | - | - | - | - | - | - | - | |
| D | 1 | 1 | - | - | - | - | - | - | - | - | - | - | |
| E | 0 | 0 | - | - | - | - | - | - | - | - | - | - | |
| ER-07 B | 1 | 0 | 0 | 1 | - | - | - | - | - | - | - | - | |
| C | 12 | 0 | 0 | - | - | - | - | - | - | - | - | - | |
| D | 36 | 0 | 1 | - | - | - | - | - | - | - | - | - | |
| E | 38 | 0 | 0 | - | - | - | - | - | - | - | - | - | |
| ER-08 B | 5 | - | - | - | - | - | - | - | - | - | - | - | |
| C | 6 | - | - | - | - | - | - | - | - | - | - | - | |
| D | 33 | 0 | low | - | - | - | - | - | - | - | - | - | |
| E | 8 | 0 | 0 | - | - | - | - | - | - | - | - | - | |
| ER-09 B | - | - | - | - | - | - | - | - | - | - | - | - | |
| C | 18 | - | - | - | - | - | - | - | - | - | - | - | |
| D | 8 | - | - | - | - | - | - | - | - | - | - | - | |
| E | 3 | - | - | - | - | - | - | - | - | - | - | - | |
| ER-10 B | 0 | 3 | - | - | - | - | - | - | - | - | - | - | |
| C | 7 | 0 | 1 | 1 | - | - | - | - | - | - | - | - | |
| D | 2 ^{min} | 0 | 2 | - | - | - | - | - | - | - | - | - | |
| E | 6 | 0 | 1 | - | - | - | - | - | - | - | - | - | |
| ER-11 B | 3 | - | - | - | - | - | - | - | - | - | - | - | |
| C | 25 | - | - | - | - | - | - | - | - | - | - | - | |
| D | 22 | - | - | - | - | - | - | - | - | - | - | - | |
| E | 4 | 1 | - | - | - | - | - | - | - | - | - | - | |
| ER-12 B | 1 | - | - | - | - | - | - | - | - | - | - | - | |
| C | 10 | 0 | 2 | - | - | - | - | - | - | - | - | - | |
| D | 5 | - | - | - | - | - | - | - | - | - | - | - | |
| E | 1 | - | - | - | - | - | - | - | - | - | - | - | |
| ER-13 B | 2 | - | - | - | - | - | - | - | - | - | - | - | |
| C | 2 | - | - | - | - | - | - | - | - | - | - | - | |
| D | 3 | - | - | - | - | - | - | - | - | - | - | - | |
| E | 3 | - | - | - | - | - | - | - | - | - | - | - | |
| Tech Initials | JAV/AM | AM/JAV | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | JAV/AM | |

Comments: _____

SS
20112119

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: ^{BSC} June 25/2019
 Stop Date: July 15/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments |
|---------------|--|---|---|---|---|---|---|-----|-----|-----|----|-----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| ER-06 B | ✓ | | | | | | | - | - | - | 0 | 0 | |
| ER-06 C | | | | | | | | - | - | - | 0 | 0 | |
| ER-06 D | | | | | | | | - | - | - | 0 | 0 | |
| ER-06 E | | | | | | | | - | - | - | 0 | 0 | |
| ER-07 B | | | | | | | | - | - | - | 0 | 0 | |
| ER-07 C | | | | | | | | - | - | - | 0 | 0 | |
| ER-07 D | | | | | | | | - | - | - | 0 | 0 | |
| ER-07 E | | | | | | | | - | - | - | 0 | 0 | |
| ER-08 B | | | | | | | | - | - | - | 0 | 0 | |
| ER-08 C | | | | | | | | - | - | - | 0 | 0 | |
| ER-08 D | | | | | | | | - | - | - | 0 | 0 | |
| ER-08 E | | | | | | | | - | - | - | 0 | 0 | |
| ER-09 B | | | | | | | | - | - | - | 0 | 0 | |
| ER-09 C | | | | | | | | - | - | - | 0 | 0 | |
| ER-09 D | | | | | | | | - | - | - | 0 | 0 | |
| ER-09 E | | | | | | | | - | - | - | 0 | 0 | |
| ER-10 B | | | | | | | | - | - | 0 | 0 | 0 | |
| ER-10 C | | | | | | | | - | - | 0 | 0 | 0 | |
| ER-10 D | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-10 E | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-11 B | | | | | | | | - | - | - | 0 | 0 | |
| ER-11 C | | | | | | | | - | - | - | 0 | 0 | |
| ER-11 D | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-11 E | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-12 B | | | | | | | | 0 | 0 | 0 | 0 | 0 | |
| ER-12 C | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-12 D | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-12 E | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-13 B | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-13 C | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-13 D | | | | | | | | - | 0 | 0 | 0 | 0 | |
| ER-13 E | | | | | | | | - | 0 | 0 | 0 | 0 | |
| Tech Initials | | | | | | | | CMP | CMP | BAV | A | BSC | |

Comments: _____

Embryo-Alevin-Fry Test Daily Hatch Mortality

Client: Teck
 Sample ID: N/A
 Work Order #: N/A

Start Date & Time: 7:0 June 25/2019
 Stop Date: July 15/2019
 Test Species: Redside shiner

| ID | Day of Test - No. of Mortalities (hatch) | | | | | | | | | | | | Comments | | | |
|---------------|--|-----|-----|-----|-----|-----|----|----|----|----|----|----|----------|--|--|--|
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | |
| ER-06 | B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-07 | B | 1 | | | | | | | | | | | | | | |
| | C | 0 | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-08 | B | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | 1 | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-09 | B | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-10 | B | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-11 | B | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-12 | B | | | | | | | | | | | | | | | |
| | C | | | | | 1 | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| ER-13 | B | | | | | | | | | | | | | | | |
| | C | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | | | | | | |
| | E | | | | | | | | | | | | | | | |
| Tech Initials | | ERL | BSV | CAF | CAF | ERL | W | ML | | | | | | | | |

Comments: _____

2019/12/19
SS

END OF REPORT

APPENDIX G

Statistical Output

Ordinary Least Squares (OLS) Regression between Redside Shiner Responses and Egg Selenium Concentration: TrichAnalytics data

▼ OLS Regression - Survival

| | |
|--------------------|----------|
| Dependent Variable | Survival |
| N | 56 |
| Multiple R | 0.024 |
| Squared Multiple R | 0.001 |
| Adjusted Square | 0 |
| Standard Error | 17.532 |

Regression Coefficients B = (X'X)⁻¹X'Y

| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
|----------|-------------|----------------|------------------|-----------|--------|---------|
| CONSTANT | 84.264 | 3.647 | 0 | . | 23.103 | 0 |
| T_Se_egg | 0.05 | 0.287 | 0.024 | 1 | 0.174 | 0.863 |

Analysis of Variance

| Source | SS | df | Mean Squares | F-Ratio | p-Value |
|------------|-----------|----|--------------|---------|---------|
| Regression | 9.294 | 1 | 9.294 | 0.03 | 0.863 |
| Residual | 16,597.21 | 54 | 307.356 | | |

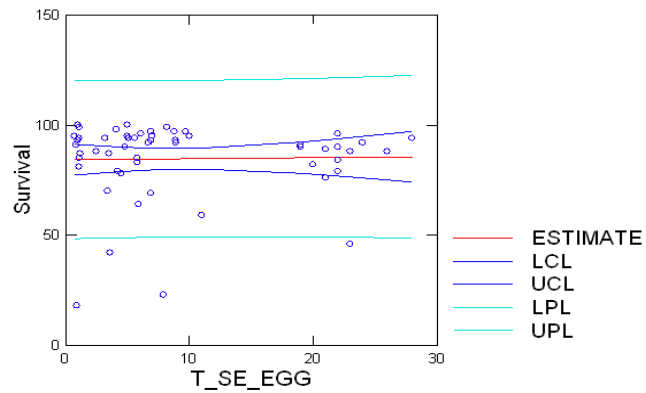
Case 35 is an Outlier (Studentizec: -4.491)
Case 45 is an Outlier (Studentizec: -4.017)

| | |
|------------------|--------|
| Durbin-Watson | 1.997 |
| First Order Auto | -0.002 |

Information Criteria

| | |
|-----------------|---------|
| AIC | 483.653 |
| AIC (Corrected) | 484.114 |
| Schwarz's BIC | 489.729 |

Confidence Interval and Prediction Interval



Excluded LNLK (18%) and ER (23%) survival outliers ID'd in original regression

▼ OLS Regression - exclude LNLK and ER survival outliers

| | |
|--------------------|----------|
| Dependent Variable | Survival |
| N | 54 |
| Multiple R | 0.1 |
| Squared Multiple R | 0.01 |
| Adjusted Square | 0 |
| Standard Error | 12.366 |

Regression Coefficients B = (X'X)⁻¹X'Y

| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
|----------|-------------|----------------|------------------|-----------|--------|---------|
| CONSTANT | 88.609 | 2.64 | 0 | . | 33.56 | 0 |
| T_Se_egg | -0.149 | 0.205 | -0.1 | 1 | -0.727 | 0.47 |

Analysis of Variance

| Source | SS | df | Mean Squares | F-Ratio | p-Value |
|------------|----------|----|--------------|---------|---------|
| Regression | 80.871 | 1 | 80.871 | 0.529 | 0.47 |
| Residual | 7,951.22 | 52 | 152.908 | | |

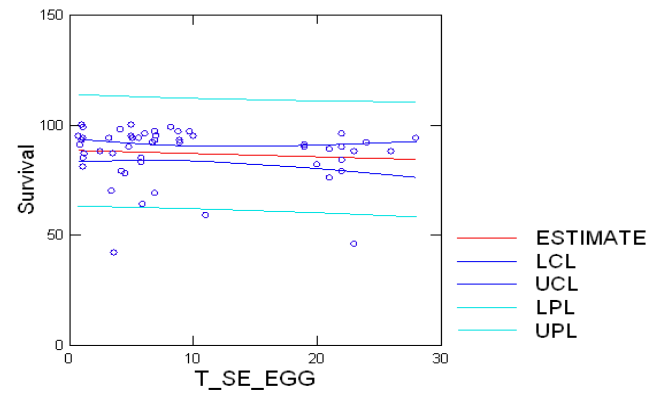
Case 13 is an Outlier (Studentizec: -3.644)
Case 25 is an Outlier (Studentizec: -4.399)

| | |
|------------------|-------|
| Durbin-Watson | 1.614 |
| First Order Auto | 0.189 |

Information Criteria

| | |
|-----------------|---------|
| AIC | 428.819 |
| AIC (Corrected) | 429.299 |
| Schwarz's BIC | 434.786 |

Confidence Interval and Prediction Interval



SELECT BEFORE_AFTERS = "b" BEFORE method refinement

▼ OLS Regression - Fertilization

| | |
|--------------------|--------|
| Dependent Variable | Fertil |
| N | 31 |
| Multiple R | 0.03 |
| Squared Multiple R | 0.001 |
| Adjusted Square | 0 |
| Standard Error | 24.156 |

Regression Coefficients B = (X'X)⁻¹X'Y

| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
|--------------|-------------|----------------|------------------|-----------|-------|---------|
| CONSTANT | 39.513 | 6.742 | 0 | . | 5.861 | 0 |
| log_T_Se_egg | 1.379 | 8.619 | 0.03 | 1 | 0.16 | 0.874 |

Analysis of Variance

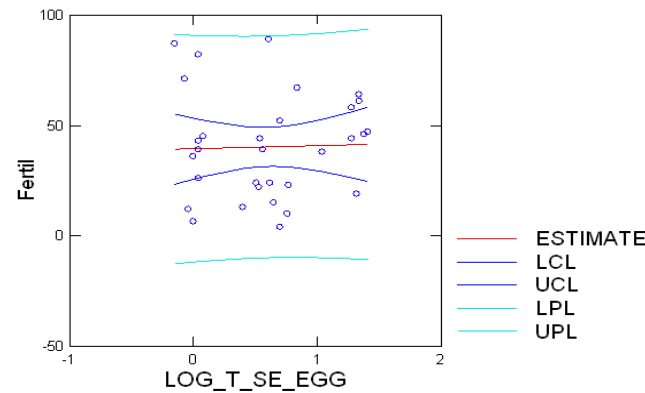
| Source | SS | df | Mean Squares | F-Ratio | p-Value |
|------------|-----------|----|--------------|---------|---------|
| Regression | 14.94 | 1 | 14.94 | 0.026 | 0.874 |
| Residual | 16,921.75 | 29 | 583.509 | | |

| | |
|------------------|-------|
| Durbin-Watson | 1.694 |
| First Order Auto | 0.121 |

Information Criteria

| | |
|-----------------|---------|
| AIC | 289.348 |
| AIC (Corrected) | 290.236 |
| Schwarz's BIC | 293.65 |

Confidence Interval and Prediction Interval



SELECT BEFORE_AFTERS = "a" AFTER method refinement

▼ OLS Regression - Fertilization

| | |
|--------------------|--------|
| Dependent Variable | Fertil |
| N | 25 |
| Multiple R | 0.022 |
| Squared Multiple R | 0 |
| Adjusted Square | 0 |
| Standard Error | 19.566 |

Regression Coefficients B = (X'X)⁻¹X'Y

| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
|--------------|-------------|----------------|------------------|-----------|-------|---------|
| CONSTANT | 66.942 | 16.887 | 0 | . | 3.964 | 0.001 |
| log_T_Se_egg | 1.678 | 15.968 | 0.022 | 1 | 0.105 | 0.917 |

Analysis of Variance

| Source | SS | df | Mean Squares | F-Ratio | p-Value |
|------------|----------|----|--------------|---------|---------|
| Regression | 4.226 | 1 | 4.226 | 0.011 | 0.917 |
| Residual | 8,804.91 | 23 | 382.822 | | |

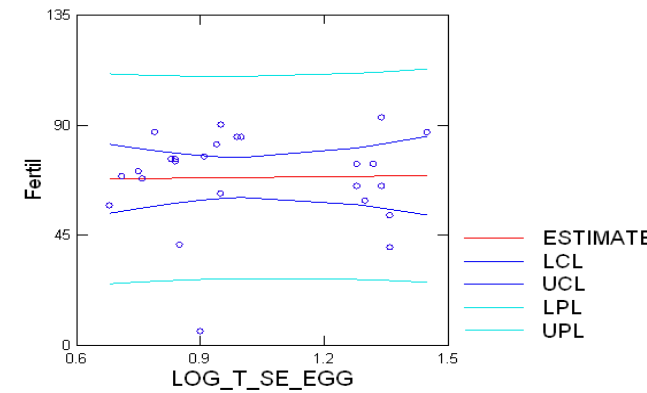
Case 45 is an Outlier (Studentizec: -4.428)

| | |
|------------------|--------|
| Durbin-Watson | 2.331 |
| First Order Auto | -0.169 |

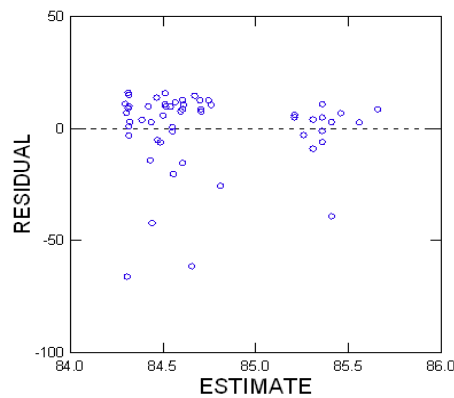
Information Criteria

| | |
|-----------------|---------|
| AIC | 223.552 |
| AIC (Corrected) | 224.695 |
| Schwarz's BIC | 227.208 |

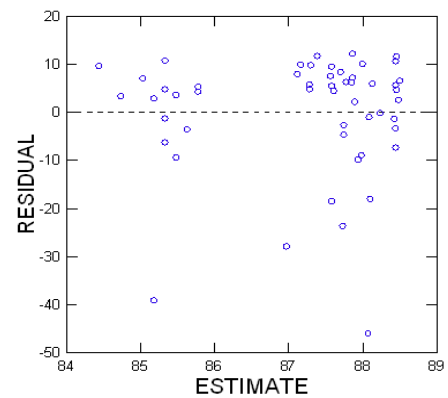
Confidence Interval and Prediction Interval



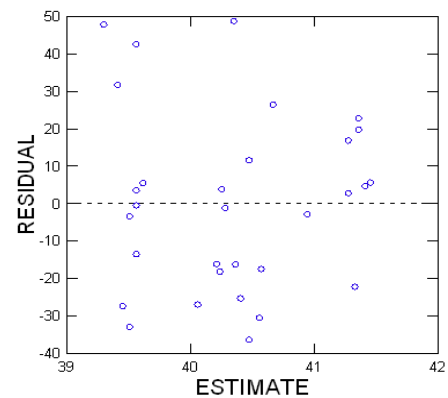
Plot of Residuals vs. Predicted Values



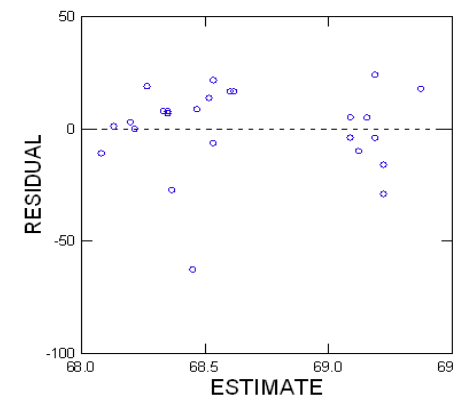
Plot of Residuals vs. Predicted Values



Plot of Residuals vs. Predicted Values



Plot of Residuals vs. Predicted Values



▼ OLS Regression - Length

| | |
|--------------------|--------|
| Dependent Variable | length |
| N | 56 |
| Multiple R | 0.006 |
| Squared Multiple R | 0 |
| Adjusted Square | 0 |
| Standard Error | 0.364 |

| Regression Coefficients B = (X'X) ⁻¹ X'Y | | | | | | |
|---|-------------|----------------|------------------|-----------|--------|---------|
| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
| CONSTANT | 7.246 | 0.076 | 0 | . | 95.786 | 0 |
| T_Se_egg | 0 | 0.006 | 0.006 | 1 | 0.041 | 0.968 |

| Analysis of Variance | | | | | |
|----------------------|------|----|--------------|---------|---------|
| Source | SS | df | Mean Squares | F-Ratio | p-Value |
| Regressor | 0 | 1 | 0 | 0.002 | 0.968 |
| Residual | 7.14 | 54 | 0.132 | | |

| | |
|---------------|-------|
| Durbin-Watson | 1.146 |
| First Order | 0.385 |

| Information Criteria | |
|----------------------|--------|
| AIC | 49.578 |
| AIC (Corrected) | 50.04 |
| Schwarz's | 55.654 |

▼ OLS Regression - Weight

| | |
|--------------------|--------|
| Dependent Variable | weight |
| N | 56 |
| Multiple R | 0.339 |
| Squared Multiple R | 0.115 |
| Adjusted Square | 0.098 |
| Standard Error | 0.052 |

| Regression Coefficients B = (X'X) ⁻¹ X'Y | | | | | | |
|---|-------------|----------------|------------------|-----------|--------|---------|
| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
| CONSTANT | 0.367 | 0.011 | 0 | . | 33.913 | 0 |
| T_Se_egg | -0.002 | 0.001 | -0.339 | 1 | -2.646 | 0.011 |

| Analysis of Variance | | | | | |
|----------------------|-------|----|--------------|---------|---------|
| Source | SS | df | Mean Squares | F-Ratio | p-Value |
| Regressor | 0.019 | 1 | 0.019 | 7 | 0.011 |
| Residual | 0.146 | 54 | 0.003 | | |

| | |
|---------------|-------|
| Durbin-Watson | 1.598 |
| First Order | 0.159 |

| Information Criteria | |
|----------------------|----------|
| AIC | -168.226 |
| AIC (Corrected) | -167.764 |
| Schwarz's | -162.15 |

Site "LNLK" excluded

▼ OLS Regression - weight

| | |
|--------------------|--------|
| Dependent Variable | weight |
| N | 46 |
| Multiple R | 0.223 |
| Squared Multiple R | 0.05 |
| Adjusted Square | 0.028 |
| Standard Error | 0.056 |

| Regression Coefficients B = (X'X) ⁻¹ X'Y | | | | | | |
|---|-------------|----------------|------------------|-----------|--------|---------|
| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
| CONSTANT | 0.355 | 0.015 | 0 | . | 24.163 | 0 |
| T_Se_egg | -0.002 | 0.001 | -0.223 | 1 | -1.515 | 0.137 |

| Analysis of Variance | | | | | |
|----------------------|-------|----|--------------|---------|---------|
| Source | SS | df | Mean Squares | F-Ratio | p-Value |
| Regressor | 0.007 | 1 | 0.007 | 2.296 | 0.137 |
| Residual | 0.136 | 44 | 0.003 | | |

| | |
|---------------|-------|
| Durbin-Watson | 1.582 |
| First Order | 0.159 |

| Information Criteria | |
|----------------------|----------|
| AIC | -131.389 |
| AIC (Corrected) | -130.818 |
| Schwarz's | -125.903 |

▼ OLS Regression GSI 1 or more

| | |
|--------------------|------------|
| Dependent Variable | GSI_1_more |
| N | 56 |
| Multiple R | 0.21 |
| Squared Multiple R | 0.044 |
| Adjusted Square | 0.026 |
| Standard Error | 18.106 |

| Regression Coefficients B = (X'X) ⁻¹ X'Y | | | | | | |
|---|-------------|----------------|------------------|-----------|--------|---------|
| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
| CONSTANT | 14.962 | 3.767 | 0 | . | 3.972 | 0 |
| T_Se_egg | -0.467 | 0.296 | -0.21 | 1 | -1.576 | 0.121 |

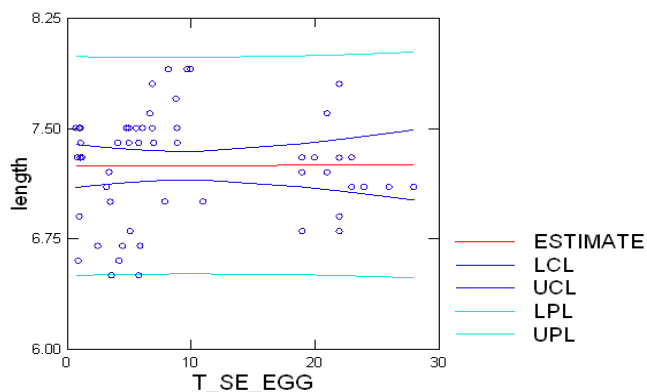
| Analysis of Variance | | | | | |
|----------------------|-----------|----|--------------|---------|---------|
| Source | SS | df | Mean Squares | F-Ratio | p-Value |
| Regressor | 814.308 | 1 | 814.308 | 2.484 | 0.121 |
| Residual | 17,702.31 | 54 | 327.82 | | |

Case 35 is an Outlier (Studentized: 6.313)

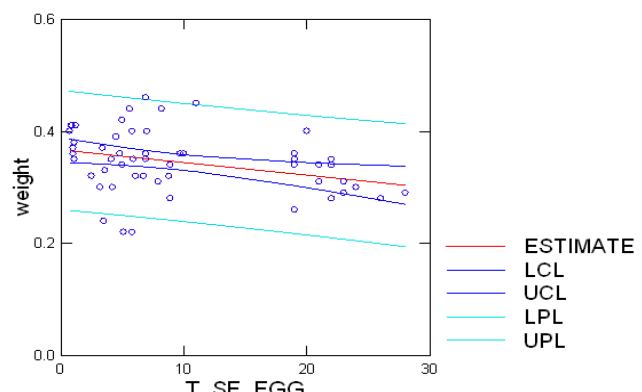
| | |
|---------------|-------|
| Durbin-Watson | 1.975 |
| First Order | 0.011 |

| Information Criteria | |
|----------------------|---------|
| AIC | 487.263 |
| AIC (Corrected) | 487.724 |
| Schwarz's | 493.339 |

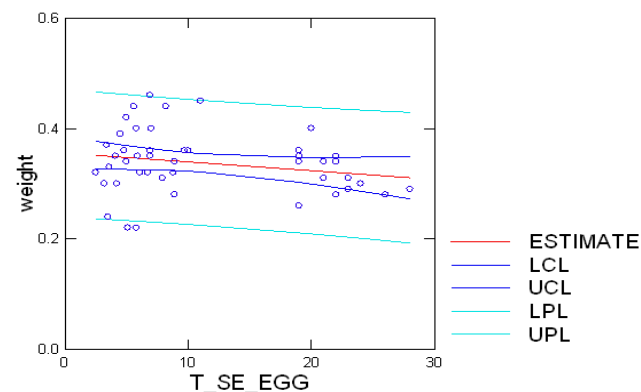
Confidence Interval and Prediction Interval



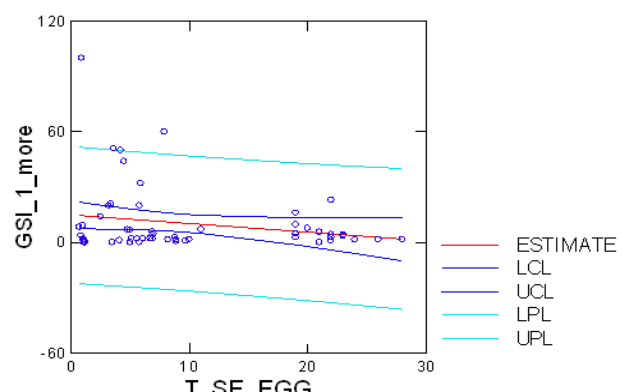
Confidence Interval and Prediction Interval



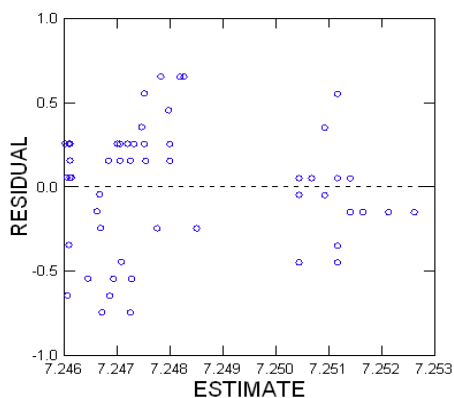
Confidence Interval and Prediction Interval



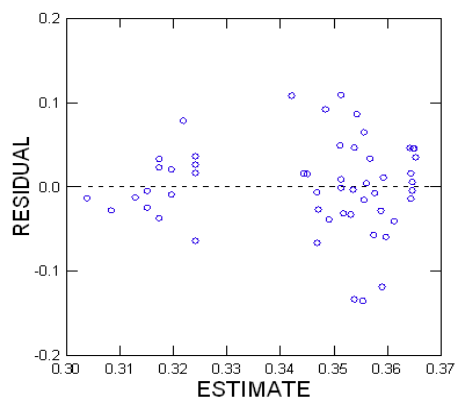
Confidence Interval and Prediction Interval



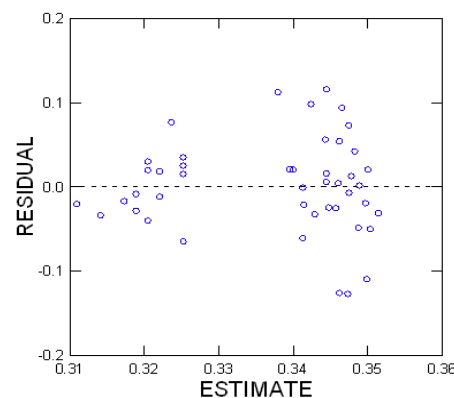
Plot of Residuals vs. Predicted Values



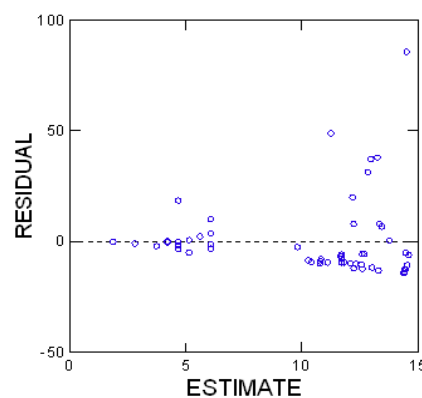
Plot of Residuals vs. Predicted Values



Plot of Residuals vs. Predicted Values



Plot of Residuals vs. Predicted Values



▼ OLS Regression GSI 2 or more

| | |
|--------------------|------------|
| Dependent | GSI_2_more |
| N | 56 |
| Multiple R | 0.228 |
| Squared Multiple R | 0.052 |
| Adjusted R Square | 0.034 |
| Standard Error | 11.336 |

Regression Coefficients $B = (X'X)^{-1}X'Y$

| Effect | Coefficient | Standard Error | Std. Coefficient | Tolerance | t | p-Value |
|----------|-------------|----------------|------------------|-----------|--------|---------|
| CONSTANT | 10.08 | 2.358 | .0 | . | 4.274 | .0 |
| T_Se_egg | -0.319 | 0.185 | -0.228 | 1 | -1.718 | 0.091 |

Analysis of Variance

| Source | SS | df | Mean Squares | F-Ratio | p-Value |
|------------|----------|----|--------------|---------|---------|
| Regression | 379.438 | 1 | 379.438 | 2.953 | 0.091 |
| Residual | 6,939.58 | 54 | 128.511 | | |

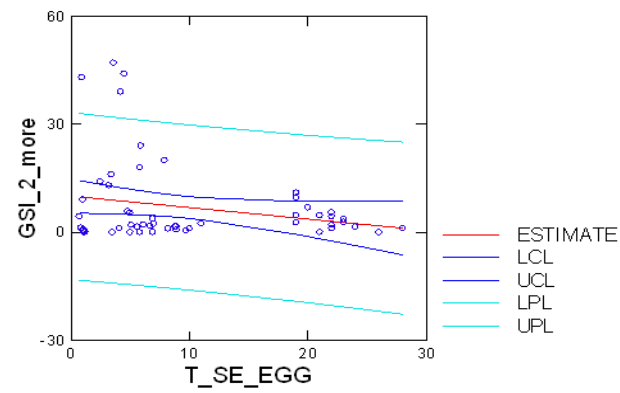
| | |
|------|---------------------------------------|
| Case | 25 is an Outlier (Studentized: 3.808) |
| Case | 26 is an Outlier (Studentized: 3.466) |
| Case | 35 is an Outlier (Studentized: 3.240) |

| | |
|---------------|-------|
| Durbin-Watson | 1.493 |
| First Order | 0.252 |

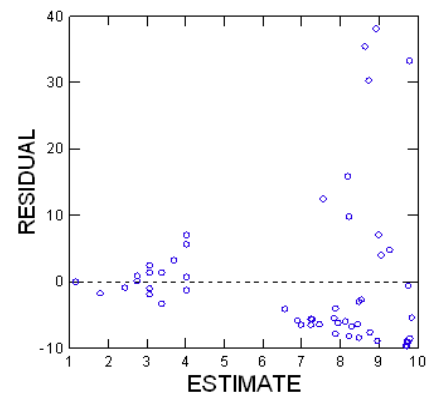
Information Criteria

| | |
|-----------------|---------|
| AIC | 434.821 |
| AIC (Corrected) | 435.283 |
| Schwarz's | 440.897 |

Confidence Interval and Prediction Interval



Plot of Residuals vs. Predicted Values





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minnow.ca