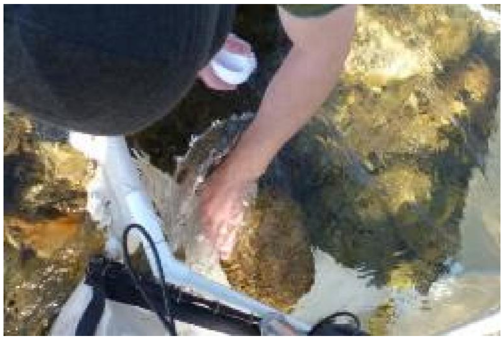
Lower Columbia River Aquatic Receiving Environment Monitoring Program for Teck Trail Operations

Annual Data Collection and Interpretation Report



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November 2014
File No.: 12-976.2

Lower Columbia River
Aquatic Receiving Environment Monitoring Program for Teck Trail Operations

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Contract No.: 932600-OS

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LIST OF ACRONYMS

µS	microSiemens
AFDW	ash free dry weight (Volatile solids)
AICc	Akaike information criterion corrected for small sample sizes
Al	Aluminum
AOI	Area Of Interest represents the Lower Columbia River from the confluence of the Kootenay River downstream to Waneta – including both reference and exposure areas (downstream of the TTS) assed within the AREMP.
AREMP	Aquatic Receiving Environment Monitoring Program
As	Arsenic
BIR	Birchbank
BC Hydro	British Columbia Hydro and Power Authority
BC MoE	British Columbia Ministry of Environment
BEP	Brilliant Expansion Project
BRD	Combined discharge from Brilliant Dam, including spill and the Brilliant Dam expansion project
Caro Labs	Caro Environmental Laboratories (Kelowna, B.C.)
CAS	Prickly Sculpin (*Cottus asper*)
CCN	Shorthead Sculpin (*Cottus confuses*)
CCME	Canadian Council of Ministers of the Environment
CII	Teck Metals Ltd. Trail Smelter combined effluent Outfall II
CIII	Teck Metals Ltd. Trail Smelter combined effluent Outfall III
CIV	Teck Metals Ltd. Trail Smelter combined effluent Outfall IV (fertilizer outfall on right bank at Stony Creek)
Cd	Cadmium
CRIEMP	Columbia River Integrated Environmental Monitoring Program
Chl-a	Chlorophyll-a
CHU	Columbia Sculpin (*Cottus hubbsi*)
Co	Cobalt
COT	Sculpin species
CRH	Torrent Sculpin (*Cottus rhotheus*)
CSR	Contaminated Sites Regularions
Cu	Copper
CV	Coefficient of variation
DEP	Depositional area sample site
DEP-EXP	Depositional area sample site situated downstream of the TTS
DEP-REF	Depositional area sample site situated upstream of the TTS
Didymo	*Didymosphenia geminate*
DO	Dissolved oxygen
ER	Exposure Ratio
ERA	Ecological Risk Assessment
ERO	Erosional area sample site
ERO-EXP	Erosional area sample site situated downstream of the TTS
ERO-REF	Erosional area sample site situated upsrteam of the TTS
EXP	Indicates sample sites/areas situated downstream of the TTS. These represent exposure area samples.
Fe	Iron
GPS	Global Positioning System
HBI	Hilsenhoff Biotic Index
Hg	Mercury
HLK	Hugh L. Keenleyside
IDZ	Initial dilution (mixing) zone of effluent receiving waters extending downstream from the TML Trail Smelter to Old Bridge.

ISQG	Interim sediment quality guideline
kcfs	Thousands of Cubic Feet Per Second
km	kilometer
L	litre
LNC	Longnose Dace (*Rhinichthys cataractae*)
LCR	Lower Columbia River
m ASL	metres above sea level
m	metre
max	maximum value
MCR	Middle Columbia River
min	minimum value
Mn	Manganese
Mo	Molybdenum
MW	Mountain Whitefish (*Prosopium williamsoni*)
N	Nitrogen
n	sample size
NMDS	Non metric multidimensional scaling
NSC	Northern Pikeminnow (*Ptychocheilus oregonensis)*
NTU	Nephlometric turbidity units
Pb	Lead
QA/QC	Quality Assurance/Quality Control
PCOC (PMOC)	Potential Contaminant of Concern (equates to potential metal of concern in this report)
PEL	Possible effects level (lower limit usually associated with the potential for adverse effects)
POM	particulate organic material
ppm	parts per million
RB	Rainbow Trout (*Onchorhynchus mykiss*)
REF	Indicates sample sites/areas situated upstream of the TTS. These represent reference area samples.
RSC	Redside Shiner (*Richardsonius balteatus*)
SD	standard deviation
Se	Selenium
Si	Silicon
SRP	soluble reactive phosphorus
TDS	total dissolved solids
Tl	Thallium
T-P	total phosphorus
TML	Teck Metals Limited
TOC	Total Organic Carbon
TRO	Tissue Residue Objectives
TSS	total suspended solids
TTS	Teck Trail Smelter
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
WP	Walleye (*Sander vitreus*)
WQIS	water quality index station
WUP CC	Columbia River Water Use Plan Consultative Committee
Zn	Zinc

DEFINITIONS

The following terms are briefly defined as they are used in this report. For a fuller explanation, please refer to scientific literature.

Term	Definition
Anaerobic/anoxic	Devoid of oxygen.
Benthic	Organisms that dwell in or are associated with the sediments.
Benthic production	The production within the benthos originating from both periphyton and benthic invertebrates.
Bioaccumulation	Removal of materials from solution by organisms via adsorption, metabolism.
Bioavailable	Available for use by plants or animals.
Biomagnification	A marked increase in a material of interest through successively higher levels of a food chain.
Catastrophic flow	Flow events that have population level consequences of >50% mortality.
Cyanobacteria	Bacteria-like algae having cyanochrome as the main photosynthetic pigment.
Diatoms	Algae that have hard, silica-based "shells" frustules.
Eutrophic	Nutrient-rich, biologically productive water body.
Exposure Area	The Columbia River within the Initial Dilution Zone and areas downstream of the TTS effluent discharges (to Waneta).
Flow	The instantaneous volume of water flowing at any given time (e.g. 1200 m^3/s).
Functional Feeding group	(FFG) Benthic invertebrates can be classified by mechanism by which they forage, referred to as functional feeding or foraging groups.
Inflow plume	An inflows seeks the layer of matching relative density in the receiving water, diffusing as it travels; High TSS, TDS and low temperature increase water density.
Left Bank	Left bank (river left) when looking downstream.
Light attenuation	Reduction of sunlight strength during transmission through water.
Limitation, nutrient	A nutrient can limit or control the potential growth of organisms e.g. P or N.
Macronutrient	The major constituents of cells: nitrogen, phosphorus, carbon, sulphate, H.
Metal of Interest	In previous studies/reports metals of interest were referred to as Potential Contaminants of Concern (PCOC).
Micronutrient	Small amounts are required for growth; Si, Mn, Fe, Co, Zn, Cu, Mo etc.
Microflora	The sum of algae, bacteria, fungi, *Actinomycetes,* etc., in water or biofilms.
Myxotrophic	Organisms that can be photosynthetic or can absorb organic materials directly from the environment as needed.
Nano plankton	Minute algae that are less than 5 microns in their largest dimension.
Pico plankton	Minute algae that are less than 2 microns in their largest dimension.
PPB or µg/L	1 part per billion (e.g. 1/6th of an aspirin tablet in 1 rail car of water (16,000 gal).
Peak biomass	The highest density, biovolume or chl-a attained in a set time on a substrate.
Periphyton	Microflora that are attached to aquatic plants or solid substrates.
Phytoplankton	Algae that float, drift or swim in water columns of reservoirs and lakes.
Redox	The reduction (-ve) or oxidation (+ve) potential of a solution.
Reducing environment	Devoid of oxygen with reducing conditions (-ve redox) e.g. water-covered organic sediments. Negative redox is usually driven by bacterial activity.
Reference Area	The Columbia River within the AOI upstream of Stoney Creek and TTS effluent discharges.
Right Bank	Right bank (river right) when looking downstream.
Riparian	The interface between land and a stream or lake.
Zooplankton	Minute animals that graze algae, bacteria and detritus from a water column.

WATER QUALITY, SEDIMENT AND TISSUE GUIDELINES

Generalized Water Quality Guidelines and Objectives

Selected Analytes	Units	LCR Water Quality Objectives		BC 2006		CCME
Water Quality General		Maximum	30-day average	Maximum	30-day average	
pH		6.5 - 8.5	-	6.5 - 9.0	-	6.5 - 9.0
Dissolved oxygen	mg/L	5.5 - 9.5	-	5 - 9 (min)	8 - 11 (min)	5.5 - 9.5
Total organic carbon	mg/L	-	-	-	± 20% of median	-
Suspended solids	mg/L	-	-	± 25	± 5	-
Turbidity	NTU	-	-	± 8	± 2	-
Metals						
Aluminum – diss.	mg/L	-	-	-	0.02	-
Arsenic – total	mg/L	-	0.005	0.005	-	0.005
Cadmium – total	mg/L	-	0.00003	Cd calc	-	Cd calc
Chromium – total	mg/L	-	0.001	-	-	-
Chromium III ion	mg/L	-	-	0.009	-	0.0089
Chromium VI ion	mg/L	-	-	0.001	-	0.001
Copper – total	mg/L	0.00717	0.002	Cu calc	-	0.002 - 0.004
Iron – total	mg/L	-	-	0.3	-	0.300
Lead – total	mg/L	0.0379	0.0048	Pb calc	Pb calc	0.001 - 0.007
Mercury – total inorg.	mg/L	-	-	0.0001	0.00002	0.00026
Nickel – total	mg/L	0.0025 - 0.150	-	0.0025 - 0.150	-	0.0025 - 0.150
Selenium – total	mg/L	-	-	-	0.00020	0.0010
Sodium – total	mg/L	-	-	-	-	-
Silver – total	mg/L	-	-	(0.0001 if hardness <100mg/L) - 0.003	0.00005 (hard <100 mg/L) - 0.0015	0.0001
Thallium – total	mg/L	-	0.0008	0.0003	-	0.0008
Zinc – total	mg/L	0.007	-	Zn calc	Zn calc	0.03
Nutrients						
Ammonia as N	mg/L	-	0.102 - 2.08 temp/pH table	0.752 - 27.7 temp/pH table	0.102 - 2.08 temp/pH table	0.019 un-ionized
Nitrate-N as N	mg/L	-	-	200	40	13
Nitrite-N as N	mg/L	-	-	0.06	0.02	0.06
Total phosphorus as P	mg/L	-	-	0.005 - 0.015 for lakes	-	-
Sulphate	mg/L	-	-	(100)	218 calc	-

Parameter/Analyte	Calculation
Cd	$10^{0.86(\log(\text{hardness})-3.2)/1000}$
Cu	(0.094(hardness)+2)/1000
Pb max	$e^{1.273(\ln(\text{hardness})-1.46)}/1000$
Pb 30 day average	$3.31 + {}_{e}(1.273 \ln(\text{average hardness}) - 4.705)$ in ug/L
SO4 (proposed 2013)	Hardness(mg/L) soft (0-30)=128 (31-75)=218 hard(76-180)=309 very hard(181-250)
Zn max	(33+0.75(hardness-90))/1000
Zn 30 day average	(7.5+0.75(hardness-90))/1000

Water Quality Guideline References

LCR Objectives: Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives, MacDonald Envi Services Ltd. 1997

BC Water Quality Guidelines http://www.env.gov.bc.ca/wat/wq/BCguidelines Nagpal et al 2006

CCME 2005 Canadian Council of Ministers of the Environment f http://st-ts.ccme.ca/

http://www.env.gov.bc.ca/wat/wq/BCguidelines/sulphate/pdf/sulphate_final_guideline.pdf

Sediment quality guidelines						
Selected Analytes	Units	LCR Sediment	BC Working Guidelines 2006		CCME	
Sediment Quality		Objective	ISQG	PEL	ISQG	PEL
Total Metals	Dry wt.					
Arsenic	mg/kg	5.7	5.9	17	5.9	17
Cadmium	mg/kg	0.6	0.6	3.5	0.6	3.5
Chromium	mg/kg	36.4	37.3	90	37.3	90
Copper	mg/kg	35.1	35.7	197	35.7	197
Iron	mg/kg	-	21,200 (2%)	43,766 (4%)	-	-
Lead	mg/kg	33.4	35	91.3	35	91.3
Mercury	mg/kg	0.16	0.170	0.486	0.17	0.486
Nickel	mg/kg	-	16	75	-	-
Selenium	mg/kg	-	2	-	-	-
Silver	mg/kg	-	0.5(Ontario)	-	-	-
Thallium	mg/kg	-	-	-	-	-
Zinc	mg/kg	120	123	315	123	315

ISQG = interim sediment quality guideline (mg/kg = µg/g)
PEL = possible effects level

NOTE: It is noted here that the Objectives cited here are more stringent than the Contaminated Sites Regulations (CSR) Schedule 9 standards for sediment.
According to the 2009 BC Lab Manual for sediment samples, the < 2 mm fraction is analyzed

Sediment Guideline References

LCR Objectives: Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives, MacDonald Envi Services Ltd. 1997
BC Water Quality Guidelines http://www.env.gov.bc.ca/wat/wq/BCguidelines Nagpal et al 2006
CCME Canadian Council of Ministers of the Environment f http://st-ts.ccme.ca/

Tissue metals guidelines for consumers of fish				
	Human Health[1]	**Wildlife**[2]	**CCME**	**BCMOE**
Analyte	µg/g	µg/g	µg/g	µg/g
Arsenic	3.5	0.47		
Cadmium		0.9		
Chromium		0.94		
Lead	0.5	0.16		0.08
Mercury	0.5	0.1	0.33	

[1] Canadian guidelines for chemical contaminants and toxins in fish and fish products. Based on fish protein (mussel) concentration (Ammend.no.11, 2011). (Can.Food.Insp.Agency 2011)

[2] LCR tissue residue objectives (TRO): Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives (MacDonald Envi Services Ltd. 1997)

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EXECUTIVE SUMMARY

Ecoscape was retained by Teck Metals Ltd. Trail Operations to complete aquatic effects monitoring as per part 3.2.1 of Effluent Permit PE02753. The work completed in 2012 and 2013 under this Aquatic Receiving Environment Monitoring Program (AREMP) is reported here. The purpose of this work is to conduct effluent monitoring in the Columbia River. A secondary purpose of the work is to provide information to Teck to facilitate management decisions for smelter operations.

The AREMP study design consisted of the following components:

1. Water Quality
2. Depositional Habitat
3. Erosional Habitat
4. Large-bodied Fish
5. Small-bodied Fish
6. Aquatic Wildlife Health

Objectives from the current study design for each of these components are summarized in the following table, along with the current status or findings of this annual report.

AREMP STUDY OBJECTIVE	
WATER QUALITY	**2013 STATUS**
1. Are Provincial Water Quality Objectives attained at the downstream end of the Initial Dilution Zone during low flows (less than 40 kfcs) as per long term trend monitoring (e.g. CRIEMP)?	Provincial Water Quality Objectives are attained at the downstream end of the IDZ, or Old Bridge Site, during low flows. The exceptions were mercury and cadmium, which exceeded the objectives or guidelines at some of the reference sites upstream of the TTS as well as below the IDZ. All nutrients were within respective water quality objectives or guidelines throughout the LCR.
2. Does water quality in the study area vary spatially (various locations in the Columbia River including point source, reference sites (both horizontal and vertical), and temporally (between seasons and years) as a result of Teck's point source effluent discharges and if so, describe the variances?	Yes, the plume stays on the right bank (~1/3 channel width) through to the end of the IDZ. Transect water sampling showed that water quality varies in the river cross-section in both horizontal and vertical stations within the IDZ, but not at Waneta. Upstream to downstream trends were detected for many metals including As, Cd, Cr, Cu, Pb, Ni, Se, Tl, and Zn. Within the IDZ, metal sources likely include effluent and groundwater discharges, and Stoney and Trail Creeks. Other potential sources of metals of interest to the LCR downstream of the smelter include stormwater, historical mining and milling, municipal effluent and naturally high metals in tributaries.
3. Are water quality parameters that are analyzed for the AREMP stations appropriate?	Yes. The overall AREMP water quality study design meets the goals of assessing potential smelter impacts. It focusses on lower flow periods where mixing and dilution are reduced and water quality impacts are expected to be greatest.
DEPOSITIONAL HABITAT	
1. What is sediment quality in the depositional areas upstream	Metals in downstream depositional areas that exceeded two standard deviations of results from reference sites were: copper, lead and zinc.

and downstream of the smelter?	In 2012, the list of metals exceeding PEL concentrations or sensitive species levels downstream of the TTS was Zn, Pb, Cu, and As.
2. Are benthic invertebrate communities in depositional sediments downstream of the smelter different from upstream communities in terms of abundance, species diversity and species composition?	A community analysis (NMDS) detected no change in invertebrate community structure between samples collected upstream and downstream of the TTS. However, increasing distance downstream from the TTS and sediment zinc and copper concentrations were negatively correlated with invertebrate abundance, species richness, and percent *Chironomidae* in depositional habitats.
3. If differences in benthic communities exist, do these differences suggest adverse effects (i.e. impairment of benthic communities such that they provide poor habitat to upper trophic consumers) and is this linked to current permitted effluent discharges?	No change was detected in benthic communities in reference and exposure areas. The depositional habitats at Maglios and Waneta were more similar in community structure to other sites assessed (upstream and downstream of the TTS) than documented in previous studies. This result may be simply due to annual variation in benthic community production or variability in habitat quality as it relates to substrate size and stability and other natural physical variables. Given that no significant difference in communities was observed in erosional habitats (including those in the IDZ) it is unlikely that the differences in depositional habitat benthic invertebrate community metrics are linked to current permitted effluent discharge.
EROSIONAL HABITAT	
1. What is the difference in periphyton communities in erosional habitat downstream of the smelter compared to the upstream communities in terms of periphyton community structure, composition, and standing crop biomass?	All metrics and statistical analyses did not detect any differences between periphyton communities in erosional habitats upstream and downstream of the smelter. Diatoms are the most prevalent type of algae in erosional river biofilms. The dominant species lists did not indicate measurable change between the reference and downstream erosional areas. Within the IDZ, where warmer water and comparatively nutrient-rich groundwater can infiltrate the river, a shift to increased concentrations of cyanobacteria and filamentous green algae was detected. This shift did not appear to be in response to metal concentrations.
2. What is the difference in the benthic invertebrate communities in erosional habitat downstream of the smelter compared to the upstream communities in terms of community structure and composition? If differences in benthic communities exist, do these differences suggest adverse effects (i.e. impairment of benthic communities such that they provide poor habitat to upper trophic consumers) and is this linked to current permitted effluent discharges?	Overall species richness did not differ between reference and downstream areas and species diversity was also similar. The mean EPT richness and mean %EPT were both higher in downstream areas and mean Hilsenhoff Biotic Index score was less than reference sites - indicating a greater predominance of pollution sensitive species downstream of the TTS. Erosional habitats in exposure areas were documented as having higher mean invertebrate abundance compared to reference sites. The greatest sampled abundance was recorded in the near-field exposure area just downstream of TTS Outfall CIII. No shifts in community composition between reference and exposure areas was documented. Based on comparison with reference sites, benthic invertebrate community health is good in erosional habitats downstream of the TTS. Water velocity is the most important covariate influencing invertebrate abundance, EPT richness, percent EPT, and diversity in LCR erosional habitats.
3. On the basis of qualitative review, is there a trend in periphyton and benthic metrics over time?	There is currently insufficient data available to qualitatively assess whether changes in benthic invertebrate communities are occurring over time. Other studies on the Columbia River upstream of the TTS have documented high annual and seasonal variation in invertebrate community metrics (Larratt et

	al 2013). Additional sampling in subsequent years (as outlined in the AREMP study plan (Golder 2012a)) may help to support a qualitative observation of trends.
LARGE BODIED FISH TISSUE	
1. How do concentrations of total metals in the tissues of large bodied fish species in the lower Columbia in 2012 compare to concentrations since 2000?	Since 2000 declining trends are evident for arsenic, cadmium, and lead concentrations in fillets of mountain whitefish, Rainbow Trout, and Walleye. No trend is apparent with chromium and mercury with the current data. There is insufficient data from previous years to assess for potential trends of other metals of interest that may be concentrated in fish tissue.
2. Do fish tissue concentrations exceed relevant human consumption guidelines?	Concentrations of metals in fish fillets were within the published Canadian guidelines for chemical contaminants and toxins in fish for consumption.
SMALL BODIED FISH TISSUE	
1. Is there a difference in tissue metals composition and concentration in small-bodied fish between reference areas and exposure areas downstream of the TTS?	Differences in concentrations between sculpin collected in reference and exposure areas were relatively low, yet statistically significant in all cases. Fish sampled from exposure areas downstream of the TTS generally had higher lead levels than the other metals.
2. Do tissue metal concentrations decrease in small bodied fish as the distance from the smelter effluent discharge increases?	Sculpins sampled in the IDZ downstream of the Combined III outfall had markedly higher tissue metals concentrations than those captured upstream of this location. Tissue metals concentrations decreased in sculpins sampled further downstream from the TTS beyond the IDZ.
3. Is there a difference in the length, weight, liver weight, gonad weight and condition of fish collected upstream of the TTS and downstream of the TTS?	There was no significant difference in various condition indicators between upstream and downstream areas.
4. What is the relationship between the distance from the effluent discharge and tissue metals, condition factor, liver weight (liversomatic index) and gonad weight (gonadosomatic index)?	There was no strong relationship between distance from the TTS effluent discharges and the various conditions metrics that were evaluated.
WILDLIFE	
1. On the basis of 2012 monitoring data, what are the potential risks to Belted Kingfisher, Great Blue Heron, Mallard, Osprey and the River Otter in the Lower Columbia River from the TML permitted effluent discharges as modeled with more recent data?	The calculated exposure ratios (ERs) demonstrated that none of the wildlife receptors are exposed to concentrations that have been associated with adverse effects (probability of predicted ER value greater than 1.0 was less than 10%). Therefore, based on data collected during this effort there are no unacceptable risks associated with TML permitted effluent discharges to aquatic dependent wildlife such as belted kingfisher, great blue heron, mallard, osprey and the river otter.
2. Are these risks similar to those identified in the 2007 ERA?	In general, the predicted ER values in the current assessment are within an order of magnitude of the results from the 2007 EcoRA.

In summary, community-level adverse responses were not detected in this study that would be attributable to influence of the Teck Trail Smelter operations on the Lower Columbia River area of interest.

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SCHEDULE A - STUDY AREA MAPS AND SAMPLING LOCATION INFORMATION

APPENDICES

1.0 INTRODUCTION

Ecoscape has been retained by Teck Metals Ltd. Trail Operations (Teck) to complete aquatic effects monitoring as per part 3.2.1 of Effluent Permit PE02753. The purpose of this work is to conduct effluent receiving water monitoring in the Lower Columbia River. A secondary purpose of the work is to provide information to Teck to facilitate management decisions for smelter operations.

There are several sources of metals in the study area, including but not limited to:

- Smelter discharge, for which an Aquatic Ecological Risk Assessment study has been conducted (Golder 2007);
- Groundwater discharge, for which a hydraulic interception and treatment system is currently being designed per the 2012 Final Remediation Plan (Golder, 2012c);
- Stoney Creek, which is currently under additional investigation per the Final Remediation Plan;
- Trail Creek, which is currently under investigation in the Annable area of Warfield;
- Non-Teck influences including storm sewer discharge, pulp mill effluent and municipal sewage effluent; and.
- Naturally occurring metals.

Sources other than the permitted Teck discharges, described further below, have a potential influence on the health of the aquatic receiving environment but are outside the scope of this AREMP. However, due to the integrating nature of the Lower Columbia River (LCR), any impacts of these sources could not be assessed separately from the effluent discharge, and it is therefore acknowledged that the AREMP will measure parameters as a result of all influences on the river, not just the Trail effluent discharge.

The content of this report is based on the Proposed Study Design for Teck Trail Smelter AREMP (Golder 2012a). The following report describes project objectives, outlines management questions and methods carried out to address each element of the AREMP. The report subsequently presents the results and analyses that assess influences of the TTS to meet the project objectives and to ensure environmental diligence and compliance with regulatory requirements.

The requirement to carry out an AREMP was delegated to Teck from BC MoE in 2011 for studies to be conducted in 2012 through 2014 on the Lower Columbia River. It involves monitoring of water quality, sediment quality, periphyton communities, benthic invertebrate communities, small-bodied fish and large-bodied fish, and the assessment of wildlife health. This report summarizes findings from January 2012 through July 2013.

1.1 Background Information

There is a significant body of research on the Lower Columbia River (LCR) aquatic environment in Canada collected over the years by a variety of entities. Teck Trail Smelter has commissioned numerous studies and reports on a wide range of potential effects of past and current smelter operations. These efforts provide historic data that provide context for this study.

During the course of these studies, Teck Metals Ltd. and its predecessors have undertaken a series of significant site improvements that include, but are not necessarily limited to:

- 1981: effluent treatment plant
- 1981: stripped zinc electrolyte was routed to fertilizer plant instead of river discharge
- 1982: mercury removal plant constructed
- 1991: construction of a drainage control system to route wash water and stormwater to the effluent treatment plant
- 1993: Heat exchanger installed in lead smelter, reduced Hg loading
- 1994: Phosphate-based fertilizer production was terminated, lowering Hg load to LCR
- 1995: cessation of slag discharge to the LCR
- 1997-98: installation completed and operation of KIVCET flash lead smelter commenced
- 1997-98: seepage collection system along Stoney Creek;
- 2003: a closed industrial landfill was capped with an engineered membrane
- 2005: a permanent storage system was created for arsenic containing wastes

These improvements have had a positive effect within the receiving environment, such that the Aquatic Ecological Risk Assessment study (Golder 2007) concluded that there was no compelling evidence of smelter-related risks or impacts on fish, aquatic plants or insects.

Potential metals of concern identified in earlier studies of the LCR included:

Water: arsenic, cadmium, chromium, copper, lead, zinc, mercury, thallium
Groundwater: Total Dissolved Solids (TDS), ammonia, nitrate, nitrite, sulphate, fluoride, chloride, dissolved metals/metalloids (antimony, arsenic, cadmium, cobalt, copper, iron, lead, manganese, magnesium, selenium, sodium, thallium, uranium, and zinc)
Sediment: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, thallium, zinc
Fish tissue: zinc, copper

We were able to utilize this information to focus our efforts in this AREMP study.

1.2 Potential Metal or other PCOC Sources to the LCR

Table 1-1 summarizes permitted effluent discharges to the Lower Columbia River as of 2006.

Table 1-1: Permitted Effluent Discharges to the Lower Columbia River (2006).

Location	Permit #	Discharge Description	Approximate Discharge (m^3/day)
LCR – between HLK dam and Castlegar, BC	PE 1272	Zellstoff-Celgar - final industrial effluent	177,000
	PE 7622	Lion's Head Inn -2° treated domestic effluent	20
	PE 80	City of Castlegar - treated effluent	2,728
	PE 5594	Pope and Talbot Ltd-treated effluent	>10
	PE 4008	City of Castlegar - treated domestic effluent	1,600
	PE 141	Selkirk College- 2° treated domestic effluent	536
Kootenay River upstream of LCR confluence	PE 17354	Skanska-Chant Joint Venture	14.5
	PE 11702	Kootenay Mobile Home Park domestic effluent	43.6
LCR – Trail, BC	PE 02753	Teck Smelter - industrial effluents, cooling water	296,000
LCR – downstream of Trail, BC	PE 274	Kootenay Regional District - 2° treated effluent	10,500
	PE 71	Village of Montrose - 2° treated effluent	640
Beaver Creek	PE 133	Village of Fruitvale - treated effluent	910
	PE 2500	Village of Salmo - treated effluent	455

Source: BC MoE Nelson, 2006 (After Golder 2007)

In addition to these permitted effluent discharges, storm water runoff is discharged into the LCR at numerous locations. Urban stormwater from Trail, Rossland, and Warfield discharge to the LCR via Trail Creek (Golder, 2007c). An unknown quantity of runoff from highways, roads, railways and transmission lines may also affect the LCR. Furthermore, other industries and agricultural developments have the potential to impact the LCR.

The focus of this study is on potential metals of concern associated with the smelter that may affect the LCR. Metal sources influenced by the smelter are outlined in the following sections.

Stoney Creek

Stoney Creek, located just upstream of the smelter has contributed metals to the Columbia River (Teck Cominco 1998). The Stoney Creek watershed is affected by historic waste disposal and storage activities that contributed to elevated metal drainage from seepage and surface runoff. This stream also received runoff from an urban area and a municipal landfill. Lower Stoney Creek is currently under additional investigation as per the Final Remediation Plan (Golder 2012c).

Historic Slag Discharge

Slag is a granulated by-product of the smelting process. It is a particle consisting primarily of silica, calcium and iron, and it contains small amounts of base metals including zinc, lead, copper and cadmium (Golder 2007b). Although grain size is similar to sand (DeBrito and Saikia 2013) slag has a density of >2.9 g/cm^3 (Cox et al. 2005), while coarse sand has an average density of 2.65 g/cm^3.

Discharge of slag to the LCR was discontinued in 1995. Prior to 1995, about 360 tons of slag were reportedly deposited to the LCR daily (MacDonald 1997).

Outfalls

The Trail smelter has three permitted outfalls. The distribution of discharged metals in the effluent is governed by fluid dynamics. Results from a CORMIX modeling exercise predicted that outfall plumes are diluted by the river flow to metal concentrations near background concentrations within a short distance from the diffusers (Table 1-2). The model also predicted that the plumes may combine with the main groundwater plume that upwells between CII and CIII along the western bank of the river (Golder 2010).

Table 1-2: Teck Metals Ltd. Trail smelter estimated effluent plume dimensions during Columbia River low flow periods (Golder 2012b).

Discharge Name	Discharge Type under normal LCR Flows	Monitoring Parameters	CORMIX predicted plume dimensions at Low Flow 1% dilution
Combined CII	Multi-port diffuser	Cd,Cu,Hg,Pb,Zn, pH	1300m long x 35m wide
Combined CIII	Multi-port diffuser	TSS, Zn, As, Pb, Cd, Hg, Cu, Tl, pH	1700m long x 20m wide
Combined CIV	Multi-port diffuser	Hg, NH_3, Zn, pH	25m long x 9m wide
Stony Creek	Surface Discharge		130m long x 8m wide
Groundwater	Sub-surface plume		near CII and CIII discharges (inferred on maps)

A Rhodamine-B dye tracer study was conducted in the LCR during low flows in April 1997and it identified faster attainment of 1% dilution than the CORMIX model, indicating that model results were conservative.

Groundwater

Hydrogeological investigations have been undertaken across the smelter and surrounding area over a period of more than 15 years. Results of these studies has led to the identification of an ammonium sulphate groundwater plume which is considered to be the result of comingling plumes resulting from historical disposal and materials handling processes.

A hydraulic interception and treatment system is currently being designed to address the main groundwater plume as per the 2012 Final Remediation Plan (Golder 2012c).

Groundwater investigations indicate that shallower portions of the plume discharge to the LCR adjacent to the smelter, while the deeper portions of the plume migrate beneath the Columbia River through the East Trail Aquifer and eventually discharge into riverbed sediments approximately 1.3 km downstream of the Bailey St Bridge (SNC Lavalin and Golder, 2012c).

Groundwater recharge to the river is generally dependent on river stage and appears to be influenced more by the rate of change in river stage rather than by absolute river level (Golder 2011). Falling river levels result in groundwater upwelling to the river whereas rising river levels result in recharge of the aquifer by river water.

Flow Regulation

A key determinant of LCR condition is BC Hydro dam flow regulation from the HLK and Brilliant Dams. River flow is a key driver of benthic community development in all flowing waters. In addition to determining dilution, flow affects a range of co-variate parameters including substrate submergence or stranding, velocity, turbulence, sediment transport, light penetration, etc.

Summation

This report forms part of the ongoing effort to understand water quality and ecological condition of the Lower Columbia River, and the potential influence of the Teck Trail Smelter.

2.0 PROJECT SCOPE AND MANAGEMENT QUESTIONS

This project consists of six components plus data management, and is presented in Table 2-1.

Table 2-1: Components of the Teck Aquatic Receiving Environment Monitoring Program.
Water Quality
Depositional Habitat
Erosional Habitat
Large-bodied (adult sport fish) fish tissue metals
Small-bodied (sculpin) fish condition and Tissue Metals
Aquatic Wildlife Health

2.1 Water Quality

The water quality program is a long-term monitoring program designed to evaluate potential effects of Teck's permitted effluent discharges on the Lower Columbia River. Key questions to be answered as part of this program are:

Q1. Are Provincial Water Quality Objectives attained at the downstream end of the Initial Dilution Zone during low flows (less than 40 kfcs) as per long term trend monitoring (e.g. CRIEMP, BC MoE)?

Q2. Does water quality in the study area vary spatially (various locations in the Columbia River including point source, reference sites (both horizontal and vertical), and temporally (between seasons and years) as a result of Teck's point source effluent discharges and if so, describe the variances?

Q3. Are water quality parameters that are analyzed for the AREMP stations appropriate?

The AREMP study design recommended water sampling near the shoreline as well as within the water column at specified transect locations. Further, the sampling design also recommended water sampling throughout different seasons within years and events between years. Finally, to help assess specific effects of the smelter, controls were included in upstream areas such as Birchbank located above any potential Teck Trail Smelter (TTS) influences.

The effluent plume model prepared by Golder Associates (2012b) also provided background information on the estimated and monitored distances from where effects may be detected. These data also provide background for sampling events and sample sites to clarify potential specific effects. Finally, a review and preparation of proposed recommendations to help further develop the plume model were developed. Effluent plume validation using 2012-13 water quality transect data is presented under separate cover.

2.2 Depositional Habitats

The objective of the depositional habitat component of the AREMP is to assess potential effects of permitted effluent discharges on depositional benthic communities by comparing benthic invertebrate structure and composition between areas upstream (reference) and downstream (exposure) of the smelter. Specific study questions for this component include:

Q1. What is the sediment quality in the depositional areas upstream and downstream of the smelter?

Q2. Are the benthic invertebrate communities in depositional sediments downstream of the smelter different from the upstream communities in terms of abundance, species diversity and species composition?

Q3. If differences in benthic communities exist, do these differences suggest adverse effects (i.e. impairment of benthic communities such that they provide poor habitat to upper trophic consumers) and is this linked to current permitted effluent discharges?

For the purposes of this study, adverse effects were defined as decreases in abundance, species diversity and species composition to values outside of the normal range such that the benthic communities may be impaired and provide poor nutrition to upper trophic consumers. The normal range is calculated as the variation among reference upstream sites plus/minus two standard deviations of the mean of multiple reference areas. Values outside of this normal range are, for purposes of this report, considered to be outside the range of natural variability and therefore indicative of potential effects on benthic communities (Golder 2012a).

Sediment quality for benthic invertebrates is a key component of this work program and assessments of sediment quality at three reference and seven exposure sites was assessed.

Benthic invertebrates are often used as indicator species because their community structure and diversity are affected by: substrate, water quality, velocity, desiccation/drying, particularly on regulated systems like the Columbia, distance downstream of a point discharge, etc. Metals are known to influence biological communities in riverine ecosystems.

2.3 Erosional Habitat

Primary objectives of the erosional habitat sampling components are to assess effects of the effluent discharge on benthic invertebrate and periphyton communities in these habitats. Specific study questions are:

Q1. What is the difference in periphyton communities in erosional habitats downstream of the smelter compared to the upstream communities in terms of periphyton community structure, composition, and standing crop biomass?

Q2. What is the difference in the benthic invertebrate communities in erosional habitats downstream of the smelter compared to the upstream communities in terms of community structure and composition?

Q3. On the basis of qualitative review, is there a trend in periphyton and benthic metrics over time?

This aspect of the work program is similar to the depositional habitat program and focuses on identifying impacts of the effluent discharge by looking for observed changes in community structure and diversity in periphyton and benthic communities.

2.4 Large Bodied Fish Tissue Monitoring

Primary objectives of this component are to assess potential effects of effluent discharge, particularly metals concentrations, on fish tissues (measured in fillets, whole fish samples, and gut contents).

Specific study questions are:

Q1. How do the concentrations of total metals in the tissues of Mountain Whitefish, Rainbow Trout, and Walleye in the lower Columbia in 2012 compare to the concentrations since 2000?

Q2. Do fish tissue concentrations exceed relevant human consumption guidelines?

The tissue sampling program is intended to investigate whether accumulations of metals occur in fish as a result of the TTS effluent discharges. Fish aging and condition assessments were a key component of this work program and were completed as part of the Lower Columbia River Fish Indexing Program (Ford and Thorley, 2011).

2.5 Small Bodied Fish Tissue Monitoring

The small-bodied fish program was developed by Ecoscape (2013) after the original AREMP study design.

The following are the key questions and a brief summary of how the AREMP addresses them:

Q1. Is there a difference in tissue metals concentration in small-bodied fish between reference sites and exposure sites downstream of the TTS?

Q2. Do tissue metal concentrations decrease in small bodied fish as the distance from the smelter effluent discharge increases?

Q3. Is there a difference in the length, weight, liver weight, gonad weight and condition of fish collected upstream of the TTS and downstream of the TTS?

Q4. What is the relationship between the distance from the effluent discharge and tissue metals, condition factor, liver weight (liversomatic index) and gonad weight (gonadosomatic index).

The study attempted to address differences in metal accumulation in small fish tissue based on species with short home ranges. Sample sites coincided with previous metals analysis work completed for the TTS including benthic analysis, water quality, and large bodied fish tissue analysis.

Age, sex, total length, and weight, and liver and gonad weight were documented for each individual caught.

2.6 Wildlife Health

Wildlife modelling in support of the AREMP was completed by Intrinsik (2013). This report is included in Appendix J.

Objectives of the wildlife component of the AREMP were to:

1. Determine the current risks to Belted Kingfisher, Great Blue Heron, Mallard, Osprey, and the River Otter in the Lower Columbia River based on current (2012/2013) data relevant to Teck permitted effluent discharges.

2. Evaluate how current risks relate to those predicted in the Terrestrial ERA (Cantox Environmental 2003, Intrinsik 2007).

3.0 METHODS

The location of all study areas and sample sites in the LCR area of interest for water quality, sediment quality, small bodied fish, benthic invertebrate sampling etc., are illustrated in the Map Sheets (Schedule A) included at the end of this report.

3.1 Water Quality

This water quality study focused on identifying specific effects of effluents on LCR water quality. The study area for the water quality sampling component of the AREMP includes the mainstem Lower Columbia River from Birchbank to the Waneta monitoring station just upstream of the Pend d'Oreille River confluence and the Canada - United States (US) border. Monitoring sites are shown on the attached map sheets and are consistent with previous monitoring programs.

These sites include:

Birchbank – upstream reference site (9.7km upstream of smelter)

Stoney Creek – 100 m downstream of Stoney Creek (1.9 km upstream of smelter)

New Trail Bridge – 20 m upstream of the Bailey Street bridge, within the initial dilution/mixing zone (IDZ) (0.2 km downstream of smelter)

Old Trail Bridge – 20 m upstream of bridge, marks end of initial dilution/mixing zone (1.1 km downstream of smelter)

Waneta – 15.8 km downstream of smelter, above Pend d'Oreille River confluence

Water quality sampling was conducted from February to September. In 2012, five shoreline grab samples were collected from March 28 to April 27 during minimum flows by Golder to calculate the 30-day average as requested by BC MoE (Figure 3-1). In 2013, shoreline grab sampling was conducted by Ecoscape on March 28, April 9, and April 29. Shoreline sampling included one grab sample from each of the 5 sites: Birchbank (reference site), Stoney Creek, New Trail Bridge, Old Trail Bridge, and Waneta. Both Ecoscape and Golder used identical methodologies.

Transect sampling was completed on April 9, April 15, and July 26 by Golder and on September 25-26 by Ecoscape during 2012 (Figure 3.1). Transect sample dates in 2013 included February 18-19, March 14-15, and April 15-16 and were conducted by Ecoscape. For transect sampling, a series of six samples were collected with two near-shore grab samples, and four mid-channel samples collected with a Van Dorn bottle sampler, of which two were 1 m below the water surface and two were one meter above the substrates (Figure 3-2). A total of 30 samples plus 3 samples for quality assurance and quality control (QA/QC) were collected during each sampling event. The purpose of the transect sampling is to evaluate the spatial homogeneity or variability across the river channel. This sampling design was based on the 2011 water quality monitoring program developed for the AREMP (Golder 2012a).

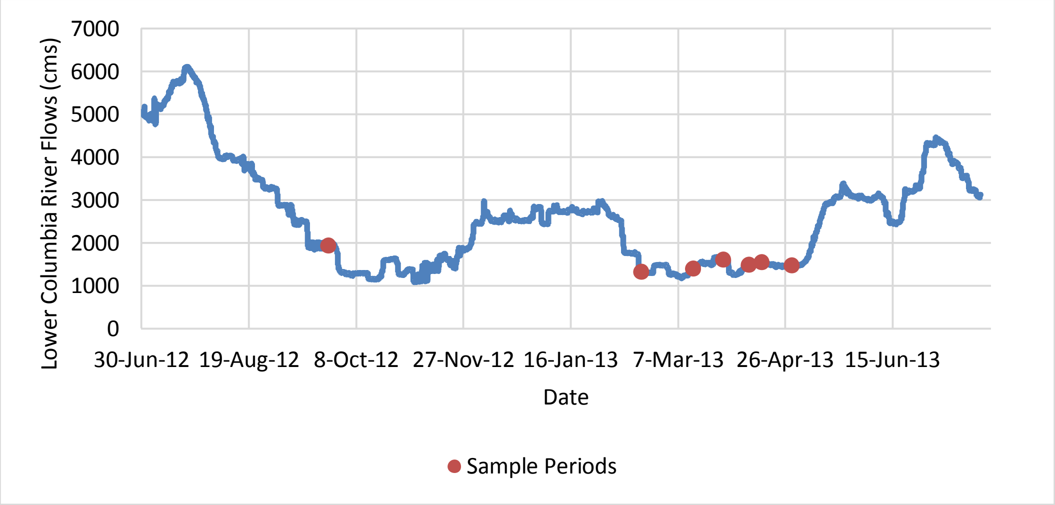


Figure 3-1: Lower Columbia River flows and the 2012-13 AREMP water sampling periods. Flow data is based Birchbank datum (Water Survey of Canada: http://www.wateroffice.ec.gc.ca/graph/graph_e.html?stn=08NE049)

The Birchbank reference site was included in all water quality sampling events to help assess specific effects of the smelter.

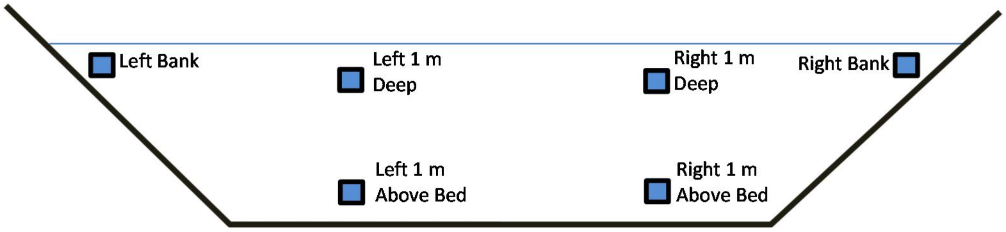


Figure 3-2: Schematic of transect water sample locations across the Columbia River channel (*Perspective: Looking downstream*). Transects were completed at Birchbank (reference site), Stony Creek, New Bridge, Old Bridge, and Waneta.

The water quality program was developed to evaluate the effects of the permitted effluent discharges by the TTS on the LCR. For this reason, sampling effort was concentrated in the spring low flow period to gather data when dilution of effluents is minimized.

The AREMP sampling schedule is summarized below:

- **January** (winter low flows) one transect sampling event
- **March-April** (spring lowest flows prior to freshet) three shoreline sampling events and 2 transect samples
- **July** (summer) one transect sampling event
- **September** (fall) one transect sampling event

3.1.1 Water Quality Field Parameters

Water quality field parameters were measured with a pre-calibrated Hanna HI 9828 by lowering the sonde to the prescribed depth upstream of the sample site, then allowing the boat to drift downstream until the sonde cable was vertical and on site before the reading was recorded in the meter memory. Parameters included: GPS location, temperature, dissolved oxygen, percent dissolved oxygen saturation, pH, conductivity, total dissolved solids, and salinity. The data were downloaded from the meter computer to a stand-alone computer at the end of every sample collection session. Water depths were measured with a SpeedTech hand-held depth sounder and a boat-mounted Lowrance HDS 7 chartplotter. Back-up field meters included a Hanna HI 9025C multi-meter, a Eutech Instruments pHTestr-20 for pH verification, and a Hanna conductivity meter.

Lab parameters included:

1. Specific conductivity, total alkalinity, hardness, pH, TSS, TDS, BOD_5, TOC, turbidity;
2. Major ions Ca, Mg, K, Na, Br, Cl, F, SO_4;
3. Nutrients including ammonia, nitrate+nitrite, TKN, total phosphorus, dissolved phosphorus ;
4. Total (not filtered) and dissolved (field-filtered) ultra-low metals scans with method detection limits lower than 5 times the BC MoE water quality guideline for the protection of aquatic life by Inductively-Coupled Mass Spectrometry (ICP-MS).

3.1.2 Water Quality Data Analysis

Water quality data were evaluated using a variety of techniques. Data exploration techniques including descriptive statistics (mean, minimum, maximum, standard deviation, etc.) were used to compare reference sites to exposure sites. Box plots were prepared to visually display the results.

Efforts were made to separate confounding influences such as storm water, municipal effluent or Celgar impacts by searching the data for signature chemistry, and by comparing spatial-temporal trends in the water quality parameters. Analysis determined how water quality parameters were associated with each other along the sample sites within the permitted effluent discharge regime.

The water quality data was compared to applicable guidelines and LCR objectives in the reference areas, the IDZ, and the downstream far-field areas. Spatial and temporal variations were subsequently described.

An examination of transect sampling data was used to investigate the effluent plume model (Golder 2012b). After reviewing data collected in 2012, a proposed program to improve the effluent plume model was developed. A spatial approach to mapping the effluent plume yielded valuable results. Near-field parameters such as temperature, conductivity, and marker metals helped identify plume limits. From this data, a spatial analysis was completed that maps the physical location of the plume in three dimensions (Hawes and Larratt 2013).

Non-detectable results are common in metal detection samples. Where non-detects were reported, null values were substituted with the value equaling ½ of the method detection limit (MDL) as per Huston and Juarez-Colunga (2009).

3.1.3 Quality Assurance / Quality Control for Water Samples

Quality assurance is a critical aspect of any monitoring program on trace metals because of the ultra-low levels of the analytes and subsequent susceptibility of samples to contamination. QA-QC reports from the labs can be found in Appendix L.

Field Quality Assurance

Prior to transect sampling, sample bottles were pre-labeled and stored in large zip-lock bags, organized by site. The sampling boat and associated gear were pressure-washed prior launching at Trail to remove road grime that could affect sampling, and to limit the potential for accidental transport of invasive species. Sampling began at reference sites and progressed downstream. Samples were collected from the prescribed depths and sites in a cleaned, low metals Van Dorn bottle sampler. Sample bottles were provided by ALS Environmental Laboratories and Caro Labs with the appropriate preservatives pre-measured in vials. Sample bottle caps, syringes and filters were triple-rinsed as needed with sample water to minimize contamination from atmospheric deposition. Metals sample bottles were triple-rinsed and immediately field-filtered on rinsed, prescribed syringe filters. All field sample preservation methods prescribed by ALS Lab were observed. Latex gloves were worn for all sample handling except Hg samples, when clear vinyl gloves were worn. The filled sample bottles were immediately placed on chipped ice and couriered to ALS Labs in Burnaby, B.C. within 48 hours of collection.

Duplicate instruments were used for field parameters where calibration is prone to drift such as pH. Where agreement was within instrument tolerances, the Hanna multi-meter data was taken as correct. When agreement was not within tolerances, the multi-meter was re-calibrated. The data was downloaded from the multi-meter computer to a stand-alone computer at the end of every sample collection session.

Lab Quality Assurance

Standard water quality sampling methods were employed, as well as all instructions from the labs

Every sampling event QA/QC involved 1 travel blank (lab double de-ionized water (DDI) travels unopened), 1 field blank (Lab DDI water handled as sample water) and up to 3 duplicate samples (labels did not tell the lab which samples they duplicate). The minimum number of QA/QC samples is 3 per transect sampling event (n=33 – 30 samples plus 3 duplicates). Lab reports were checked on receipt of data and queries or requests for sample re-analysis were sent as soon as possible and within the sample hold times. Requests for re-analysis were based on differences between the sample duplicates that exceeded accepted tolerances, generally 20 - 50% difference, or an outlier result that exceeded the range of standard deviation for the applicable results to date. The lab was also directed to retain samples until they were notified that they could dispose of them or until the hold times specified in Standard Methods had expired. Additional QA/QC protocols were also undertaken at ALS and Caro Labs.

The lab was asked to report the data electronically in Excel and PDF format. A technical memorandum was sent to Teck noting any concerns such as an elevated result, and recommending further actions as needed, such as re-sampling. The memorandum was sent to Teck within five working days of receipt of the final lab report(s).

3.2 Sediment Quality Monitoring

The following are specific data that were collected at 10 depositional sediment sample sites. All samples were collected followed sampling procedures outlined in Clarke (2003) and other standardized, acceptable scientific techniques. Sampling sites were outlined in the AREMP and are (Maps 1-10):

1. Three of the sample sites were in reference areas at Kootenay Eddy, Genelle Eddy, and Birchbank Eddy.

2. Seven exposure sample sites were established at Korpak, Maglios, Casino, Airport Bar, Trimac, Fort Shephard Eddy, and Waneta.

For sediment sampling, 4.35 cm diameter clear Plexiglas™ corers were pushed into the substrate to a depth of 15 cm and the 200 cm^3 core was transferred to a large zip-lock bag. Five cores were added to each bag to create a composite sample from a variety of sub-sample locations within the confines of the designated sample site. The sediment sample was mixed thoroughly and a 500 cm^3 sediment subsample retained and stored in a cooler on ice and delivered to Caro Labs Kelowna for processing.

Supporting data collected at each sediment sample site included:

1. Substrates were assessed using a GIS approach at all 10 sediment sites. Each habitat unit sampled was mapped in GIS. The percentage cover of each type of substrate was developed. This GIS approach allows long-term tracking of sediment erosion and deposition in the river and facilitates documentation of habitat change over time.

2. Water velocity, channel morphology (run, riffle pool, etc.), bankfull width, and sample depth was collected at each site. Velocity at each sample site was collected using a Marsh McBirny or a Swoffer flow meter depending upon water depth. Velocity was collected at three positions in the water column; ~5 cm off of the bed level, 40% column, and at the surface.

3. The percentage of cover of aquatic macrophyte was estimated visually at each sample site.

4. In-situ pore water quality was collected such as temperature, dissolved oxygen, total dissolved solids, turbidity, pH, specific conductivity, redox at each site as close to the sediment sub-sampling locations as reasonably possible.

5. The distance from the point of discharge was determined using GIS as measured from the centerline of the channel to the sample site. This data

was useful in assessing potential gradients that may exist from the point of discharge.

All of the above data was collected in a spatial framework using GIS as well as stored in other standard data formats including Microsoft Excel.

In the Larratt Aquatic lab, sediment samples were examined for presence of slag, both wet and dry, in white sorting trays and photographed with a macro lens. The Columbia River samples were compared to slag samples obtained from the smelter. The samples were mixed with distilled water and reviewed under 400 power on an inverted microscope fitted with a second high intensity lamp as a side-light. Several microscope photographs were shot from each sample as an archived record to corroborate observations. Records were kept of: dark silt, possible slag, organic debris, protozoa, small invertebrates, bacteria, fungi, Didymo tubes, algae, vascular debris, pollen, etc.

In the Caro analytical lab, the strong acid leachable metals (SALM) soil procedure was followed, according to the British Columbia Environmental Laboratory Manual 2009 procedure (prescriptive) for total sediment metals. Sub-sampling was done using approximately 50 g of sample for drying. According to the 2009 BC Lab Manual method, the sample is dried, then disaggregated and sieved to < 2 mm. This < 2 mm fraction is used for analysis. Large stones, rocks, debris, etc. are excluded from the analyzed sample. This method provides the sample preparation procedure for the analysis of total metals, as referenced within the BC Contaminated Sites Regulations. The method achieves near-complete recoveries of some important metals, but many others are only partially recovered, such as aluminum, barium, beryllium, chromium, strontium, titanium, thallium, and vanadium. Metals not dissolved with this method are unlikely to be of environmental consequence (British Columbia Environmental Laboratory Manual: 2009). This method is applicable to the following parameters:

Aluminum Al-T, Iron Fe-T, Silver Ag-T, Antimony Sb-T, Lead Pb-T Sodium Na-T, Arsenic As-T, Lithium Li-T, Strontium Sr-T, Barium Ba-T, Magnesium Mg-T, Sulfur S-T, Beryllium Be-T, Manganese Mn-T, Thallium Tl-T, Boron B-T, Mercury Hg-T, Thorium Th-T, Cadmium Cd-T, Molybdenum Mo-T, Tin Sn-T, Calcium Ca-T, Nickel Ni-T, Titanium Ti-T,, Chromium Cr-T, Phosphorus P-T, Uranium U-T, Cobalt Co-T, Potassium K-T, Vanadium V-T, Copper Cu-T, Selenium Se-T, and Zinc Zn-T.

Statistical analysis of the highly variable sediment data was restricted. Data analysis relied on comparison to guidelines and to historic values using percent difference. Where statistics were used (for example Pearson's correlation coefficient), we used ½ of the detection limit where specific metal concentrations were below the method detection limit.

3.3 Periphyton Monitoring

3.3.1 Erosional Habitats

Cobble-size substrates were randomly selected from sample areas that had been continuously submerged for at least 10 weeks so that they had well developed periphyton communities. Although sampling in the spring prior to the increasing freshet hydrograph was the preferred sampling window identified by Golder (2012a), the alternative fall sampling was selected in 2012 because the spring conditions were not suitable due to exceptionally high flows

Sample areas were selected that had similar water depth, flow patterns, velocity, substrate size, macrophyte cover and shading. Adapting the generalized random tessellation stratified spatially-balanced Survey Design (Stevens and Olsen 2004), five randomly chosen near-shore cobbles were obtained from wadeable areas within each of five sample sites potentially exposed to smelter discharges and two upstream reference sites for a total of 35 samples (Figure 3-3). Additional ‘oversamples’ but were not needed in 2012.

Each sample was composed of five subsamples that were collected from the top of each cobble surface. To minimize natural variation, samples were collected from the apex surface (parallel to the water surface) of smooth cobbles 20-50 cm in diameter. This process was repeated to collect three individual replicate samples, using the methods found in the USEPA Rapid Bioassessment Protocol for Periphyton (Barbour et al. 1999).

Fifteen smooth cobbles 20-50 cm in diameter were selected and placed on 3 plastic trays at the river’s edge to minimize drying (Figure 3-3a). Each tray was sampled separately for a trio of three replicate samples from each site. A 19 cm^2 cylinder fitted with a flexible rubber gasket (internal diameter reached by scrub brush was 14.9 cm) was held firmly on the cobble, then a scalpel, modified toothbrushes and a squirt bottle filled with filtered river water were used to remove all the periphyton within the sampler diameter (Figure 3-3b). The rock and funnel were rinsed into a beaker to a total volume of 100 mL. Coarser sand and sediments were noted but not added to the sample. This was repeated for all 5 rocks of a given sample to give a final volume of 500 mL per replicate. Samples were chilled with ice to 2^oC prior to shipping.

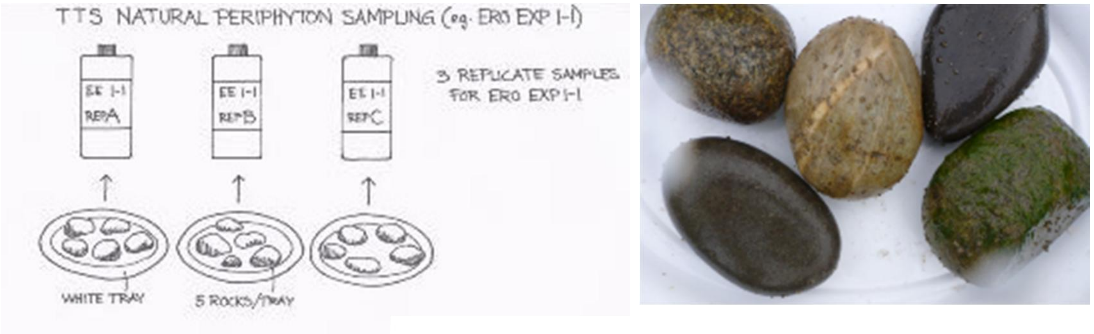


Figure 3-3a

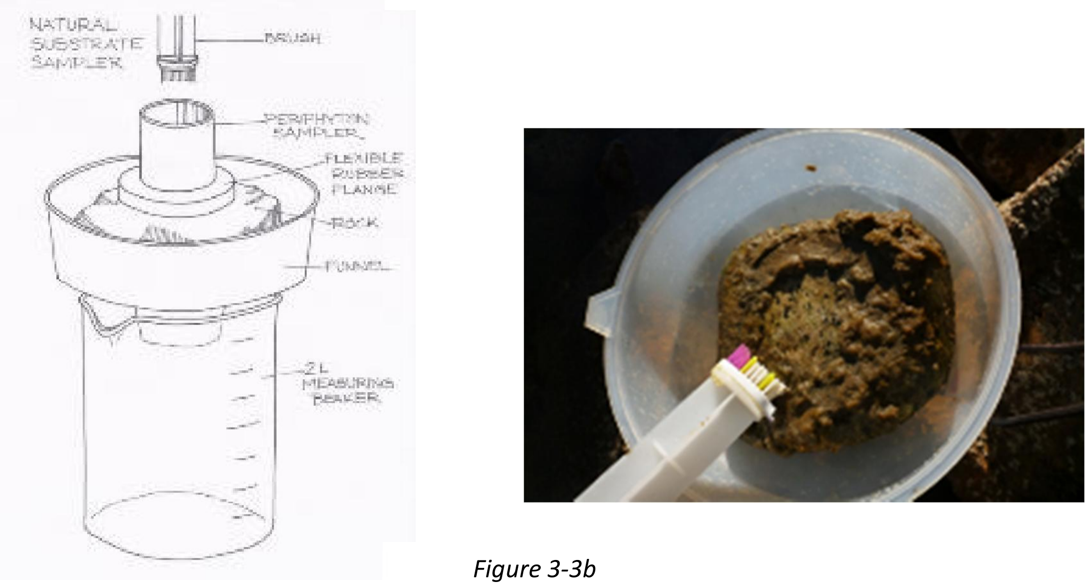


Figure 3-3b

Figure 3-3: Illustration of natural cobble substrate periphyton sampling in the LCR.

In the Larratt Aquatic algae lab, each replicate was agitated, and 200 mL subsampled to a glass jar and preserved with 0.2 mL of Lugol's preservative. These preserved samples were refrigerated to await taxonomic analysis. The remaining sample water (300 mL x 3) was batched in a triple-rinsed 1 L brewers flask shielded with aluminum foil to exclude light. A 500 mL chl-a sample was cut, refrigerated and kept dark until delivery to Caro Labs Kelowna within 24 hours. A total of 35 chl-a samples plus 3 field duplicates were submitted to Caro Labs.

For taxonomy, each 200 mL sample was transferred to a triple-rinsed 600 mL beaker and agitated with a stick blender for 30 seconds before a 10 mL subsample was extracted and allowed to settle in a 5.3 cm diameter settling chamber for 24 hours (periphyton identification description, section 3.3.5).

3.3.2 Depositional Habitats

Objectives of this assessment were to determine the effects of effluent discharges on depositional habitat periphyton community structure and diversity. Periphyton samples were collected from the same ten depositional sites that were used in the depositional sediment sampling component of this study.

Depositional areas having approximately 20-40 cm of water cover were opportunistically sampled for periphyton using the petri dish sampling method outlined in Barbour et al., (1999). Briefly, sand or silt substrate samples were collected by inverting a large 8.85 cm diameter petri dish, sliding a flat spatula under the dish, and lifting the surface sediment sample. This 55.4 cm^3 sample was agitated in a plastic sample bottle with 500 mL of 0.45 micron filtered river water and a 250 mL sample promptly decanted into a pre-labeled sample jar. This was repeated three times to get three replicate samples from each depositional area.

For periphyton taxonomy, each 250 mL sample was transferred to a triple-rinsed 600 mL beaker and agitated with a stick blender for 30 seconds before a 10 mL subsample was extracted and allowed to settle in a 22 cm^2 settling chamber for 24 hours (periphyton identification description, section 3.3.5) at the LAC lab.

3.3.3 Non-photosynthetic Microflora

To characterize very small non-photosynthetic members of the periphyton biofilm, 9 biofilm samples were collected in pre-sterilized standard bacterial bottles as follows: 2 samples from depositional reference (DEP-REF) sites, 1 sample from the erosional reference (ERO-REF) site, 2 samples from depositional exposure (DEP-EXP) sites, and 4 samples from erosional exposure (ERO-EXP) sites. Samples were stored on ice and delivered to Caro Labs, Kelowna within 24 hours. At the lab, samples were cultured for heterotrophic bacteria plate count, fungi, yeasts and molds, according to Standard Methods (2005).

3.3.4 Drift Samples

Drift algae and zooplankton samples were collected from areas upstream and downstream of smelter outfalls on the September 2012 sample event. This small effort (four samples) was intended to help explain periphyton recruitment from the drift as it affects periphyton production and community structure. The 80 micron mesh plankton net was rinsed three times before use in each reach. After the 1 m deep, 1 minute tow was complete, the net was brought on board and the sample decanted from the trap into a 300 mL plastic bottle with an airspace retained for zooplankton respiration. Samples were chilled immediately using ice to limit predation within the sample and preserved with 2 mL Lugol's solution within 6 hours of collection. They were then refrigerated at Larratt Aquatic labs until they were processed.

3.3.5 Periphyton Identification, Enumeration and Measurements

The following describes periphyton sorting and identification techniques. These methods are consistent with those currently used in similar studies of the Mid and Lower Columbia River for BC Hydro.

1. Samples were settled in counting chambers over 24 hours. Cells were counted along mid-section transects examined at 400×-800× magnification under a phase contrast inverted microscope.
2. Intact cells containing cytoplasm were counted as live, and cells without cytoplasm were counted as dead, to determine a live: dead ratio.
3. Counts continued until 300-500 cells were counted and taxa relative abundance stabilized. Counting continued if taxa relative abundance had not stabilized. Vigorous shaking of the sample did not always break up algae clumps before the subsample was withdrawn. Cells of filamentous and colonial taxa were separated from counts of unicellular taxa because of their clumped distribution.
4. Microscope photographs of typical assemblages were taken from each sample and archived for Teck.
5. Algae cell dimensions were measured to allow for the calculation of biovolumes. Algal cell biovolumes were calculated using published geometric formulae (Hildebrandt et al., 1999; Diaina, et al., 2006). Twenty specimens from each taxa were measured to the nearest 0.1 micron using ScopePhoto 3.0 image processing software. Median measurements were used to calculate cell biovolumes. Calculated biovolumes were compared to the range of sizes reported in published literature as a QA/QC step.
6. All parts of the microflora were evaluated from the settled samples, noting prevalence of detritus, vascular debris, bacteria, fungi, yeasts, and micro-grazers (protozoa) to accurately estimate productivity.
7. While diatoms usually dominate LCR periphyton, the inclusion of very small members of the periphyton biofilm in the taxa counts, including nano-periphyton (<2 – 20 microns), and pico-periphyton (>0.2 – 2 microns) bacteria and fungi facilitates accurate estimates of productivity as they usually form a significant component of the overall periphyton community (Stockner 1991; Wetzel, 2001). High power (600 – 900×) magnification was used for visual identification of species. Dr. J. Stockner's (UBC) verification of the taxonomy of these small, difficult to identify species was invaluable.
8. All data were recorded in Excel spreadsheets for later analysis.
9. In lieu of the preserved diatom reference samples that have an unfortunately short shelf life, microscope photographs of typical LCR periphyton assemblages were archived from each taxonomic sample.

These photos provide a record that is usable at least to the genus level, and includes non-diatom components of the periphyton.

10. About 20% of these samples were selected for taxonomic verification by Dr. J. Stockner (UBC). Dr. Stockner used a variety of microscopes to verify identifications, particularly for the nano- and pico-periphyton. Any taxonomic corrections/ nomenclature variations from existing data were clearly identified in a comparison table. All other taxonomic evaluations were performed by H. Larratt, Larratt Aquatic Consulting Ltd.

Phycologist Dr. J. Stockner also compiled a master species list for the Columbia System using current taxonomic nomenclature. In addition to his master-list, keys used during this work include:

References:

Patrick and Reimer; The Diatoms of the United States
Wehr and Sheath Freshwater Algae of North America
Canter-Lund and Lund Freshwater Algae; Their Microscopic World Explored
Prescott; Algae of the Western Great Lakes
Cyanobacteria Image Gallery; http://www-cyanosite.bio.purdue.edu/images/images.html
River Diatoms: a multi-access key; http://craticula.ncl.ac.uk/EADiatomKey/html/taxa.html
Academy of Natural Sciences ANSP Algae Image Database; http://diatom.ansp.org/AlgaeImage/SearchCriteria.asp

Periphyton data were entered into Excel spreadsheets as the samples were read. Computers were backed up daily to an off-site server and hard copy stored at both Ecoscape and Larratt Aquatic offices. Replicate preserved samples were refrigerated at Larratt Aquatic's office as back-up samples and were discarded after six months.

3.3.6 Environmental Impact Prevention

Invasive "Didymo" (*Didymosphenia geminata)* is present in the LCR and can spread readily though transport of contaminated sampling gear. Felt soles of waders have been implicated in this diatom's spread globally. As a result, all wader boots used by Ecoscape were soaked for 1 minute in a salt solution containing 70 g NaCl/L before the soles were dried in the sun for several days or frozen for a week (Matheson et al., 2007).

3.3.7 Periphyton Quality Assurance/Quality Control

H. Larratt performed taxonomic investigations on all samples, with about 20% of periphyton samples going out to Dr. J. Stockner for taxonomic verification as part of our QA/QC program. The following four steps were incorporated in the taxonomic investigations for this AREMP. These steps match the practices currently used by H. Larratt and Dr. Stockner in MCR and LCR investigations, and include:

1. Documenting the live: dead ratios of diatoms prevents an overestimation of the standing crop, and provides insights into the nutritional value of the periphyton.

2. Inclusion of very small members of the periphyton biofilm in the taxa counts, including nano-periphyton (<2 – 20 microns), pico-periphyton (>0.2 – 2 microns) bacteria and fungi prevents a significant under-estimate of productivity. Generation time of these small simple forms is a matter of hours, and they are usually a significant component of the overall periphyton community (Stockner 1991; Wetzel, 2001).

3. Algae cell dimensions were measured to allow for the calculation of biovolumes. Biovolume accounts for the huge difference in cell size among algae types, and allows the estimation of standing crop.

4. Drift algae samples were collected from sites above and below the smelter to allow accounting for periphyton recruitment from drift as it affects periphyton production and community structure.

3.4 Benthic Invertebrate Monitoring

The focus of the benthic invertebrate monitoring program was to assess impacts of the permitted effluent discharges on the quality of benthic habitats, together with the resultant benthic communities. Physical elements of the habitat formed an important component of this assessment.

Sampling was carried out in upstream reference and downstream exposure areas as outlined in the AREMP study plan (Golder 2012a), and an attempt was made to standardize field conditions at each site, including substrate size, macrophyte cover, etc. Study areas and sample sites within are shown in mapsheets 1-10 (Schedule A).

Two of the study areas were in upstream reference areas identified as Reference Area 1 (left bank opposite Stoney Creek and CIV outfall) and Reference Area 2 (Birchbank).

Five downstream exposure study areas were sampled at sites identified as downstream Exposure Area 1 through Exposure Area 5. Sites within each of the upstream and downstream areas were randomly chosen using ARC GIS spatial tools. No additional sample sites were added as oversamples because all designated areas were effectively sampled.

3.4.1 Erosional Habitat Sampling

At each sample site, a series of 5 modified surber/kick samples (Figure 3-4) were collected from undisturbed river bed (moving in upstream direction). The sample net had a mesh size of 400 microns in accordance with standard CABIN (2012) protocols. The 5 samples were combined to form one composite sample. The kick sampler quadrat was 0.56 m^2. Thus once combined, the total area sampled at each site was 2.8 m^2.

- Substrates were assessed at all sample sites. The percentage composition of each substrate type (e.g., boulder, cobble, gravel, etc.) was recorded;

- Water velocity, channel morphology (run, riffle pool, etc.), bankful width, and sample depth was collected at each site. Velocity was collected using a Swoffer flow meter. Velocity measurements were collected at three positions: ~5 cm off of the bed; 40% column; and, at the surface.

- In situ water quality was collected (temperature, dissolved oxygen, total dissolved solids, turbidity, pH, specific conductivity, redox) at each sample site.

- The distance from the three smelter effluent outfalls (CII, CIII, and CIV) was determined using GIS as measured from the centerline of the channel to the sample site. This data was used in assessing potential gradients that may exist from the points of discharge.

Figure 3-4: Erosional site on right bank within initial dilution zone (*left*). Sampling benthic invertebrates from erosional habitat using a modified kick/surber method (*right*).

3.4.2 Depositional Habitats

A total of 5 benthic invertebrate samples were collected from each of the thirteen depositional areas discussed above using an Eckman dredge. The position of each of the dredges was randomly selected. Previous assessments determined that a sample size of 5 is sufficient to describe benthic variability (Golder, 2007c). Samples were then sieved in a wash bucket with 400 micron mesh (CABIN, 2012) and transferred in a labeled sample bottle. The five dredge samples were not combined but rather represented replicates for that area.

3.5 Benthic Taxonomy

Benthic invertebrate samples were field-processed by filtering samples and storing them in 70% ethanol. Fixed benthic invertebrate samples were transported to Cordillera Consulting in Summerland BC. Samples were sorted and identified to the genus-species level where possible. Benthic invertebrate identification and biomass calculations followed standard procedures. Field samples had organic portions removed and rough estimates of invertebrate density were calculated to determine if sub-sampling was required. After samples were sorted, all macro-invertebrates were identified to species and all micro portions were identified following the Standard Taxonomic Effort lists compiled by the Xerces Society for Invertebrate Conservation for the Pacific Northwest. A reference sample was kept for each representative taxon found. A sampling efficiency of 95% was used for benthic invertebrate identification and was determined through independent sampling.

Numerous metrics of benthic community structure including diversity, richness, community representation, and foraging guild are considered as raw data (Appendix F) and were compiled as part of our assessment.

3.5.1 Quality Assurance / Quality Control for Benthic Invertebrates

Lab reports on sediment and benthic samples were reviewed within two working days of receipt, and requests for re-analysis made if results were outside the 99th percentile without apparent cause. The lab reports were compared to all relevant standards and guidelines, with unusual results flagged.

3.6 Analysis of Periphyton and Benthic Invertebrate Community Response

A number of response variables were used to assess the relative effects of metals concentrations and habitat on periphyton and benthic communities in the LCR. Periphyton response variables included: 1) species richness, 2) abundance, 3) biovolume, 4) Simpson's index, and 5) chlorophyll-a production. Benthic invertebrate response variables included: 1) species richness, 2) richness of Ephemeroptera, Plecoptera, and Tricoptera taxa (EPT richness), 3) abundance, 4) % of samples made up of EPT taxa (% EPT), 5) % of sample made up of Chironomid taxa (% Chironomidae), 6) Simpson's index, and 7) Hilsenhoff biotic index.

In addition to our primary explanatory variables of effluent exposure (above or below CIII outflow), we also considered the effects of distance from HLK outflow, and several environmental variables: water depth, water velocity, and substrate (substrate size scores). In depositional sites, where sediment metal analysis was available, sediment metal concentrations of arsenic, cadmium, chromium, copper, lead, mercury, selenium, thallium, and zinc, were also considered as potential explanatory variables. We used methods described by Zuur et al. (2010) to examine multi-colinearity among sediment metal concentrations based on variance inflation factors (VIF) and correlation coefficients with high VIF scores (> 5) and correlation coefficients (> 0.7) suggesting considerable multi-colinearity among variables. Including too many explanatory variables (over-parameterization), particularly when high-multicolinearity exists among them, can greatly bias interpretations of model outputs and lead to spurious results (Zuur et al. 2010). A common method of dealing with these issues is to summarize trends in groups of collinear variables using principal component analysis and to characterize these groups of collinear variables through their principal component axes (Legendre and Legendre 2012). Sediment metal concentrations fell into two highly collinear groups based on their VIF scores and correlation coefficients. In order to avoid the above described problems associated with multi-colinearity among, and over parameterization of these explanatory variables, we summarized these two groups through their first principal components (PC1). No interpretations of metals concentrations were drawn from these principal components, rather, they were simply included as potential explanatory variables characterizing these groups of metals in subsequent linear mixed-effects models. The first grouping consisted of arsenic, chromium, copper, selenium, and zinc, the PC1 of which explained over 99% of the variation in these metals, and was primarily driven by zinc and copper (loadings of 0.99 and 0.15 respectively) with all other metals having negligible loadings <0.006. The second grouping consisted of cadmium, lead, mercury, and thallium. The PC1 of this group also explained over 99% of the variation in these metals and was driven almost entirely by lead, which had a positive loading of over 99%.

We constructed linear mixed-effects models (Zuur et al. 2008) containing all combinations of the above explanatory variables for each periphyton and benthic invertebrate response variable, with transect nested within site as random effects in depositional sites, and site as a random effect in erosional sites (n = 64 and 32 models for depositional and erosional sites respectively). We compared these candidate models through Akaika information criterion corrected for small sample size (AICc) based on Δ AICc values and AICc weights (w_i) which ranks models based upon the principal of parsimony, balancing model fit with complexity, in which the best models have the lowest Δ AICc and highest W_i. In this approach the overall relative model performance is determined, rather than assessing the significance of individual parameters or models through p-values. Because numerous models performed similarly based on these criteria, we also assessed the relative support for the effects of different explanatory variables using multi-model averaging (Burnham and Anderson 2002; Anderson 2008). In this latter approach, model averaged parameter estimates with 95 % confidence intervals (direction, variability, and size of effects) and relative variable importance (RVI: sum of W_i for all models containing a variable of interest) were calculated for each explanatory variable from 95% confidence sets of models (Burnham and Anderson 2002; Grueber et al. 2011).

Variables with 95% confidence intervals that did not span zero, and with RVI values > 0.5 were considered to be of high importance in describing variation in response variables (e.g., Burnham and Anderson 2002). We also calculated pseudo R^2 for high ranking models (derived from regressions of the observed data versus fitted values), which gives an indication of the proportion of the variance in response variables explained by an individual model (see Cox and Snell 1989; Magee 1990; Nagelkerke 1991; Piñeiro et al. 2008 for details).

In order to interpret and compare among all parameters which varied widely in scale, we conducted the above analyses after standardizing continuous explanatory variables by subtracting global means from each value (centering) and dividing by two times the SD (scaling) (Gelman 2008). Percent Chrionomidae in erosional sites was also log transformed to meet model assumption of normality. While these models generally followed assumptions of multiple linear mixed-effects models, and many performed well, individual relationships among response and explanatory variables were not always linear based on scatter plots of the data and so interpretations of effects should be limited to general direction and size, but not shape of relationships. Following this, these models are not appropriate for predictive use. All mixed-effects modeling of periphyton and benthic communities were done in the lmer package, and competed and averaged using the MuMIn package (Barton 2012), both implemented in R.

Non metric multidimensional scaling (NMDS) using Bray-Curtis dissimilarity was used to explore variation in periphyton and benthic invertebrate community composition. Data were transformed using the Bray Curtis transformation. To interpret data, cluster diagrams using Ward clustering of the Bray Curtis matrix were constructed. Finally, analysis of similarity (ANOSIM) was used to determine if groups (either Ward's or other meaningful groupings) were significantly different in composition. Community analyses of the data were completed at the species level for natural substrate data collected. The potential effects of rare species have not been accounted for in this analysis because only one year of data exists, warranting consideration of the full species dataset to detect differences in community structure between sites.

3.7 Large-Bodied Fish Tissue Monitoring

3.7.1 Field Data Collection

Fish for the large-bodied fish tissue monitoring program were obtained in coordination with the BC Hydro Lower Columbia Fish Indexing program. Fish collection, using a boat electrofisher, occurred between September 24 and October 26, 2012.

Collected fish were pooled into ‘upper’ and ‘lower’ areas, respectively. The upper reference area extended from the Hugh L. Keenleyside Dam downstream to Castlegar above the Tin Cup Rapids, and the lower exposure area extended from Beaver Creek to Waneta (Figure 3-5). Target species included Mountain Whitefish (*Prosopium williamsoni*), Rainbow Trout (*Onchorhynchus mykiss*), and Walleye (*Sander vitreus*).

The target sample size was 20 fish per species per sample area, for a total of 60 fish per area, and 120 fish in all. Adult-size fish (i.e., those targeted by anglers) were targeted for analysis since one of the primary objectives was to assess the concentrations of tissue metals relevant to human consumption guidelines. Therefore sampling was biased toward obtaining catchable-size fish (>200 mm).

Data was recorded in duplicate using water proof field paper and a hand held GPS data logger. The GPS enabled spatial documentation of where in the river fish were collected.

At the time of fish collection, fish condition was documented and included: Presence of physical abnormalities or parasites, fork length (mm), total length (mm), total body weight (g), age class, and gender.

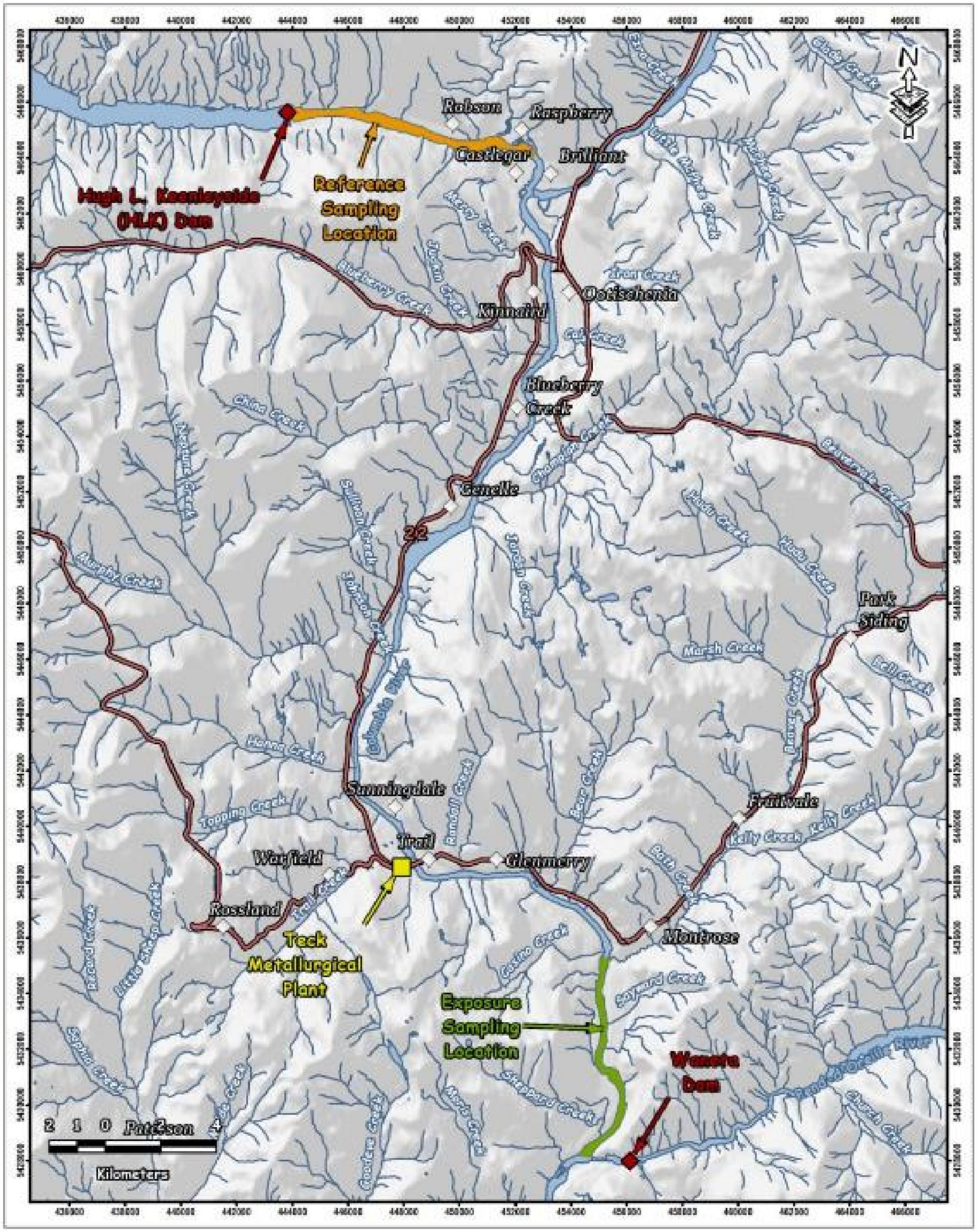


Figure 3-5: Large-bodied fish reference and exposure collection areas. Fish collection was carried out by Golder Associates as part of Lower Columbia River Fish Indexing Project (BC Hydro CLBMON-45).

Each fish was assigned a catalog number and photographed. Physical abnormalities were noted when observed and additional close-up photos were taken. The total, and fork length of each fish was measured, and the weight of the fish was documented.

Fish were placed in individual bags and euthanized in the bag to prevent potential tissue contamination. During euthanization, care was taken not to puncture the bag. The fish were then placed on ice and transferred to a deep freezer upon returning to shore after each evening of sampling.

Large-Bodied Fish Processing

Frozen fish were transported to Kelowna, where they were processed by Ecoscape staff in cooperation with Caro Analytical Labs (Kelowna), where a clean process room was provided to minimize the risk of contamination from extraneous metal sources during tissue preparation. Frozen fish were thawed prior to dissections. Only as many fish as could be processed on a given occasion were thawed.

Of the 120 fish collected, half were analyzed as skin-on fillets. The other half were analyzed as whole fish with guts removed (Table 3-1). The guts were then analyzed separately. The selection of fish for whole samples and fillet sampling was done randomly prior to initiation of processing.

Table 3-1: Large-bodied fish collection and processing summary.

Collection Area	Species	Total fish collected	Tissue Metals Analysis		
			Fillets	Whole fish (guts removed)	Gut contents
Reference Area	Mountain Whitefish	20	10	10	10
	Rainbow Trout	20	10	10	10
	Walleye	20	10	10	10
Exposure Area	Mountain Whitefish	20	10	10	10
	Rainbow Trout	20	10	10	10
	Walleye	20	10	10	10
Sample size		120	60	60	60

Sampling methods were consistent with previous studies (Golder 2007) and British Columbia Field Sampling Manual: for Continuous Monitoring and Collection of Air, Air-emission, Water, Wastewater, Soil, Sediment and Biological Sampling (Clark 2003).

High-carbon stainless steel filleting knives and stainless high carbon steel utensils (i.e., scissors, forceps etc.) were used for processing fish. Between each fish, instruments and cutting boards were washed with soap and then rinsed thoroughly with de-ionized water. Non-powdered vinyl gloves were worn by all personnel handling fish, and utensils to minimize contamination of samples.

The sampling process is outlined below:

1. The processor put on a clean pair of non-powdered vinyl gloves prior to handing the fish. New gloves were used for each fish to minimize cross contamination.

2. The thawed fish was removed from the bag and irrigated using de-ionized water to removed dirt and debris that may have been introduced during fish collection.

3. The clean fish was placed on a fresh sheet of wax paper on a cleaned vinyl cutting board. The head was cross cut vertically posterior to the eye to expose the brain case and otoliths were extracted (Figure 3-6) using tweezers and placed into a scale envelope labeled with fish catalog number and capture date for subsequent aging.

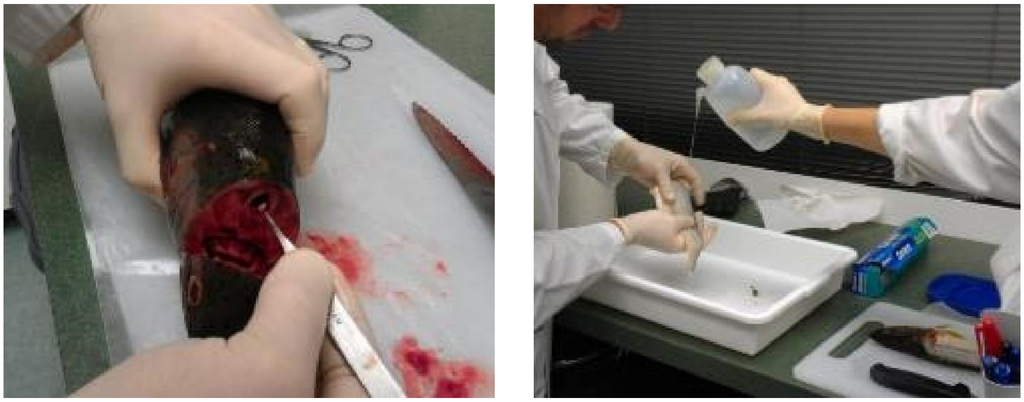


Figure 3-6: Otolith removal from Rainbow Trout (left) and cleansing a fillet using deionized water.

After the single fillet was isolated it was weighed and placed in a new, clean, pre-labeled sealable plastic bag. Each bag was labeled with the fish catalog number, date and analysis type. The whole fish and gut samples were prepared under similar conditions, using similar methods.

4. Processed samples were stored on ice and immediately sent to CARO Analytical Labs (Burnaby) for homogenization and analysis.

3.7.2 Laboratory Fish Data Collection

The prepared fish tissue samples (fillets, whole fish, and guts) were sent to Caro Laboratories (Burnaby) for tissue homogenization and subsequent analysis of percent moisture, total lipids, trace metals, and major ions.

3.7.3 Quality Assurance / Quality Control for Large-bodied Fish Analysis

To ensure precision in metals testing, 10% of the fillet samples were analyzed in duplicate. Duplicates were submitted to the lab as blind samples. When evaluating the results, duplicates needed to be 5 times the detection limit for acceptability criteria to apply (USEPA 2000). If the relative percent difference for duplicates were within 20% of each other they were accepted. If the calculated relative percent differences were greater than 50%, a quantification problem was suspected, which may have included possible contamination or lack of sample representativeness. In such instances, the lab was notified of the discrepancy and data were re-checked and samples re-run if necessary.

The accuracy of data entry was assessed with a second person checking a minimum of 10% of the data for completeness, data entry errors, transcription error and invalid data. If errors were found, then all data underwent a zero tolerance quality assurance check.

3.7.4 Fish Aging

Fish aging was undertaken by Darren Filipic, R.P.Bio. Otolith aging was conducted using a dissecting microscope.

Age structures were interpreted using John Casselman's quantitative approach to fish aging:

- O, +, or ++ are assigned based on the observation of otolith growth or not since the last annulus was formed.
- 0 is assigned when the annulus is not quite complete
- + is less than half a year’s growth (relative to previous year)
- ++ is more than half a year’s growth (relative to previous year)

3.8 Small Bodied Fish Condition and Tissue Metals Monitoring

An effects based design was adapted to measure biological variables in small-bodied fish. The overall objective of this study was to determine what potential effect (positive, negative, or neutral) effluent discharges may have on fish tissue metals concentrations, condition, and overall growth characteristics by comparing small fish collected from upstream reference sites to downstream exposure sites.

Arciszewski et al. (2010) discusses the importance of selecting suitable species as sentinels, including the following characteristics: abundant, sedentary, high site fidelity and measurable life history characteristics relevant for the assessment. Based on this, the approach adapted for the AREMP small-bodied fish study, contained the following key assumptions:

- The species is representative of the receiving environment
- The species does not migrate between reference and exposure areas
- There are minimal habitat differences between reference and exposure areas

3.8.1 Small-Bodied Fish Sampling

Three reference areas and five exposure areas were sampled for this program. These areas are identified in Schedule-A (Map sheets).

Reference site selection considered the following important factors (Environment Canada 2012):

- Reference site habitat is comparable to the exposure site habitats;
- Reference sites are free from the influence of the effluent or other potential sources of effluent like substances (i.e. other stressors or metals pollution sources); and
- Reference and exposure sites should have similar fish species compositions.

The following information was collected at each sample site:

Table 3-2: Information collected during small-bodied fish sampling.

General Information	Sampling Information	Habitat Information
Project	Water Temperature	Substrate composition
Site Name	pH	Embeddedness
Date	Electrical Conductivity	Water Velocity
Time	Dissolved Oxygen	Wetted depth
Crew	Average Wetted Depth	Bank Characteristics
Weather	Sampling Method	Habitat Condition
UTM Coordinates	Effort	
Photo Numbers	Species Sampled	
	Total Length	
	Weight	
	Gender	
	Physical condition	

Species Selection

Depending on catch success either Prickly Sculpin (*Cottus asper*) or Torrent Sculpin (*C. rhotheus*) were to be used for condition assessments and whole fish metals analysis. Both sculpin species possess ideal characteristics for a sentinel species in that they are abundant, sedentary, have high site fidelity, and have measurable life history characteristics.

Sample Timing

Timing of fish capture or sampling is determined by a number of factors including migratory behavior, gonadal development and flow conditions (Environment Canada 2013). Since gonad weights were to be used as a test parameter, sample timing was focused on when species are sexually mature. General spawning for sculpin in the Lower Columbia River has been estimated by AMEC (2012) to range from the end of May to late July when daily average water temperatures are between 9°C to 15°C. Therefore optimal timing to sample for both mature males and females would be early to mid-May just prior to spawning. Based on this, sampling was carried out May 13-16, 2013.

Sampling Methods

Fish were sampled under the Provincial Collection Permit: CB13-86505. Fish capture was completed along the riverbank (depths of 0.1 - 1.0 m) with use of a backpack electrofisher and pole seine to collect stunned fish being carried downstream by the current. Measurements recorded during electrofishing surveys included: electrofishing start/end time; electrofishing seconds; electrofisher settings as well as the length and width of the area electrofished. These data were used to calculate a catch-per-unit-effort (CPUE).

Fish were placed in a holding bucket where they were anesthetized using Tricaine mesylate or TMS as per the Canadian Council on Animal Care's guidelines for the Care and Use of Fish in Research, Teaching and Testing (CCAC 2005).

Sample Size

For this program, 30 sculpin (15 adult male and 15 adult female) were retained for tissue metals analysis from each of the 8 areas (3 reference and 5 exposure). Thus, a total of 240 sculpin were retained for metals analysis and health assessments.

All collected fish (i.e., sculpin, dace, shiners etc.) were identified and lengths, weights, and comments recorded (to assess unit effort), until the target number of sculpin had been collected. Fish not preserved for subsequent analysis were live-released after measurements had been recorded.

Retained sculpin were placed in individual clean re-sealable bags. Once inside the sealed bag, the fish were euthanized. The bag was labeled with indelible marker and placed on ice and later frozen until post-processing and dissection in the lab. Fish processing followed the approach summarized in Section 3.7.1 for whole fish samples.

Endpoint Analysis

Sculpin retained for tissue metals analysis and condition assessments had the following parameters measured.

- Total Length
- Fork Length
- Weight
- Condition (k)
- Age
- Sex
- Gonad Weight
- Liver Weight
- Tissue Metals
- General external and internal condition (i.e., presence of tumors etc.)

Fish were examined externally and internally for the presence of abnormalities, lesions, tumors, and parasites.

Fish were weighed (± 0.01 g) and measured for total length (± 0.01 mm). The gender of individuals was determined externally by the presence of genital papilla (on mature males) and confirmed during dissection.

The liver and gonads were extracted and weighed (± 0.01 g) and the gut was removed, weighed and examined for abnormalities. The guts were subsequently preserved separately in labeled vials containing an alcohol fixative. Otoliths were also removed for aging (See Section 3.7.4).

The liver and whole fish carcass were placed in separate labeled sterile plastic bags and frozen on dry ice for subsequent tissue metals analysis that was carried out by Caro Analytical (Burnaby, BC). Fish were first homogenized in the lab and subsequently analyzed for percent moisture, total lipids, trace metals, and major ions.

3.8.2 Calculation of Sculpin Condition

Physiological responses to stress in fish can be assessed by calculating the ratio of body weight to length, as well as that of the weight of certain organs relative to the total body weight or length. Declines in these indices of condition may indicate decreased energy storage, metabolism, feeding activity, or reproduction associated with environmental stressors (Barton et al. 2002). Although these indices are insensitive to short-term changes they can be useful in the detection of long-term trends in fish exposed to chronic stressors. We considered three such condition indices:

Foulton-type condition factor (k) is the relationship between body weight and body length that is commonly used to infer physical condition of fish, and can be calculated using the following formula:

$$\text{Condition (k)} = 100 \times (\text{body weight}/\text{length}^3)$$

The gonadosomatic index and liversomatic index are calculations of the respective organ mass as a proportion of the total body mass and infer reproductive output and energy storage respectfully. Respective formulae are as follows:

$$\text{Gonadosomatic index} = 100 \times (\text{gonad weight}/\text{body weight})$$
$$\text{Liversomatic index} = 100 \times (\text{liver weight}/\text{body weight})$$

3.9 Large and small-bodied fish tissue concentration and condition analyses

Concentrations of arsenic, cadmium, chromium, copper, iron, lead, mercury, selenium, thallium, and zinc in large body fish tissues were graphed for each tissue (muscle/whole body/gut) and species (Rainbow Trout, Mountain Whitefish, and Walleye) combination, and for small bodied fish (sculpin) whole body samples, comparing between those sampled in downstream exposure and upstream reference sites. Analysis of covariance (ANCOVA) was used to assess the effects of exposure (above or below CIII outfall), species, sex, and individual fork length on metal concentrations in large bodied fish species. Because the range and level of metal concentrations differed considerably in gut samples relative to muscle and whole body, these analyses were conducted for each tissue type separately.

ANCOVA were also used to assess the effects of these explanatory variables on whole body sculpin metal concentrations. Finally we used ANCOVA to assess the effect of treatment and individual gender on condition factor (k), liversomatic (LSI) and gonadosomatic (GSI) indexes of sculpin. Differences in the relationship between total body weight and total length, and liver or gonad weight with total body weight between treatments, for each sex, were also tested through ANCOVA. This latter approach provided a complimentary measure of the effect of treatment on whole body, liver, and gonad weight, correcting for body size and sex (Environment Canada 2010). Weight and length variables were log transformed in several cases to meet assumptions of normally distributed residuals or because relationships were clearly log-linear.

In some cases tissue metal concentrations were log transformed and outliers were removed from data to meet model assumptions of normally distributed residuals. Log transformed metal concentrations included arsenic, chromium, copper, lead for all three tissues types (fillet, whole body and guts), as well as iron for gut samples in large bodied fish, and arsenic, cadmium, copper, iron, lead, and thallium in sculpin (small bodied fish). In the interpretation of ANCOVA results, significance of overall models and individual parameters within them were determined through p-values at a 0.05 significance level, and direction of explanatory variable effects are determined from model parameter estimates.

3.10 Wildlife Health

Methods employed through the wildlife health modelling assessment (Intrinsik 2013) are presented in Appendix J. The assessment used water (*i.e.,* total metal concentrations), sediment, whole small-bodied fish tissue, and benthic invertebrate tissue (*i.e.,* mussels and other benthic invertebrates) data collected for the 2012-13 AREMP and estimated risks to five species with aquatic-based diets: Belted Kingfisher, Great Blue Heron (a Provincially Blue-listed listed species), Mallard, Osprey, and River Otter. A comparison was made to risks predicted in the ERA report (Intrinsik 2007). Concentrations in sediment, benthic invertebrates, and fish were calculated that may be used to screen future monitoring data to determine the potential for unacceptable risks to wildlife.

4.0 RESULTS AND DISCUSSION

4.1 Water Quality

4.1.1 General Water Quality Parameters

General water quality parameters affect numerous chemical and biological processes occurring in rivers. For example, water temperature controls the rate of many biological reactions including the rate of microflora growth. Water temperatures at the upstream LCR water quality index stations ranged from approximately 6 to 17°C annually (Figure 4-1).

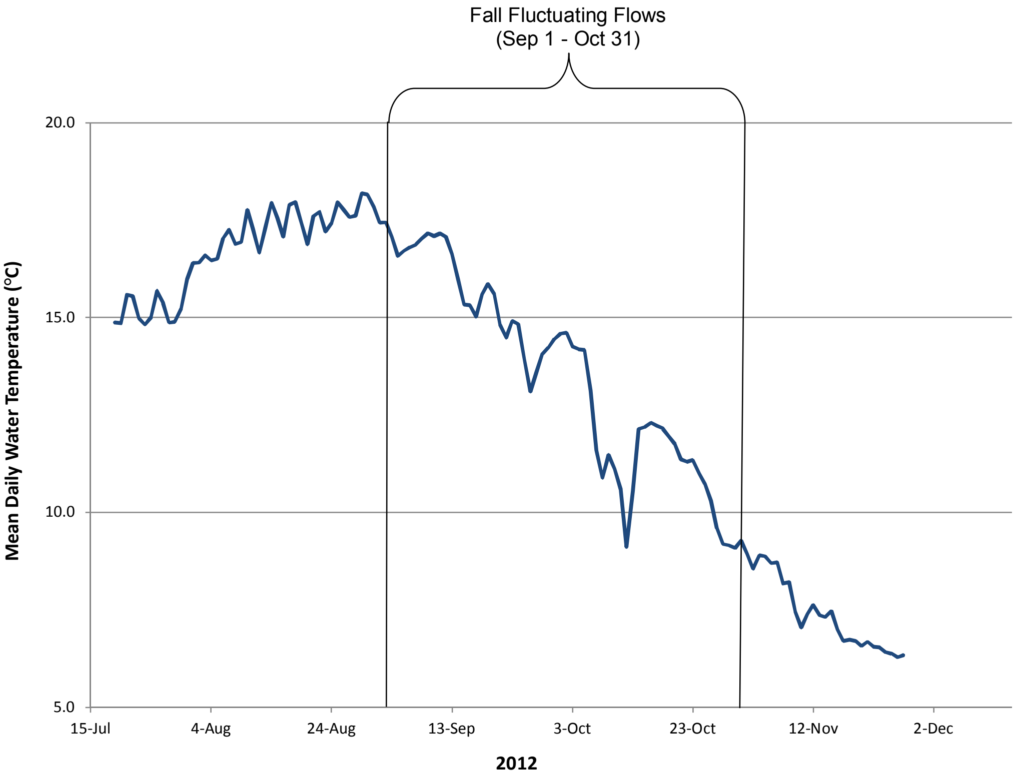


Figure 4-1: Mean Daily Water Temperatures in LCR at Genelle s, July–November, 2012 (Larratt et al, 2013).

Water temperatures observed on October 2012 were typical, with the exception of samples collected within the Initial Dilution Zone (IDZ) that were elevated by 1-2°C (Table 4-1).

Other field-measured parameters that were elevated within the IDZ included conductivity, salinity and pH. These water quality parameters were within the typical range for the LCR both upstream and downstream of the IDZ (Larratt et al.

2012) (Table 4-1). As usual for the LCR, the pH LCR Objective of 6.5 – 9.0 was met in all 2012-2013 samples from the area of interest (AOI).

All LCR erosional sites upstream and downstream of the smelter met the applicable dissolved oxygen guidelines, while a few measurements were lower than the LCR objective set by the Province near the substrates in depositional sites, particularly at the reference Birchbank site (Table 4-2). Depositional sites have low turbulence and more oxygen demand from the decomposition of deposited organics, resulting in lower dissolved oxygen than the objectives.

There was no statistical difference (T-test, $p < 0.05$) between % DO saturation at erosional sites above and below the smelter. Percent saturation ranged from 86% to 99% and averaged 95% in the 2012-2013 data. All erosional sites downstream of Trail met the LCR dissolved oxygen objective.

Table 4-1: Erosional Site Field Measurements, October 2012

	Upstream (Ref) Sites		Downstream (Exp) Sites				
Parameter	Ero Ref 1	Ero Ref 2	Ero Exp 1	Ero Exp 2	Ero Exp 3	Ero Exp 4	Ero Exp 5
	Birchbank	u/s Stoney	CIV-Stoney	CIII	CIII-Korpac	Kor-Mag	Mag-Wan
Conductance µS/cm	152	141	126	209	148	130	134
Salinity PSU units	0.07	0.07	0.06	0.1	0.07	0.06	0.06
T dissolved solids mg L	139	145	128	192	136	131	136
pH (s.u.)	7.78	7.71	8.12	8.22	8.12	7.76	7.98
Water temperature °C	14.55	14.01	13.46	15.22	14.25	13.51	13.52
Dissolved oxygen mg/L	9.26	8.95	**8.72**	9.05	8.81	9.19	9.34
Dissolved oxygen %	96.8	94.4	**91.1**	97.1	93.4	96.1	96.2

averaged over 5 samples sites within each study area

Table 4-2: Depositional Site Field Measurements, October 2012

	Upstream (Ref) Sites			Downstream (Exp) Sites						
				Dep Exp 1	Dep Exp 2	Dep Exp 3	Dep Exp 4	Dep Exp 5	Dep Exp 6	Dep Exp 7
Parameter	Kootenay Eddy	Genelle	Birchbank Eddy	Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta
Conductance µS/cm	152	137	143	135	133	133	131	133	125	134
Salinity PSU units	0.07	.07	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06
T dissolved solids mg L	156	142	134	139	137	137	136	137	124	132
pH	7.52	7.47	8.01	7.79	7.6	7.66	8.03	7.54	7.86	7.98
Water temperature °C	14.57	14.72	14.58	13.43	13.41	13.37	13.38	13.32	13.53	13.52
Dissolved oxygen mg/L	9.33	8.81	8.96	9.43	9.46	9.38	9.39	9.28	9.1	9.01
Dissolved oxygen %	98.1	93.5	93.9	97.1	98.2	96.3	96.4	95.4	95.1	93.3

In the LCR, turbidity is typically low, ranging from 0.3 to 0.9 NTU. Turbidity within the AOI averaged 0.59 ± 0.02 NTU. Similarly, total suspended solids concentrations are typically low in the LCR, ranging from <1 - 2 mg/L. Within the AOI, TSS ranged from <3.0 to 8.7 mg/L and averaged below the detection limit of 3.0 mg/L.

There are no BC guidelines or LCR objectives for specific conductivity or TDS. Both parameters returned to upstream Birchbank concentrations by the Waneta site. In both the IDZ and the entire AOI, none of the general water quality parameters exceeded the LCR water quality Objectives (Table 4-1, 4-2).

4.1.2 Nutrients

Inorganic Nitrogen

In the LCR, inorganic nitrogen typically occurs as 77% nitrate and 23% ammonia, with nitrate concentrations related to transport during high flows and ammonia concentrations primarily donated by groundwater throughout the river (Larratt et al., 2013) (Table 4-3). None of the LCR samples approached the inorganic nitrogen guidelines for aquatic life (3.0 mg/L nitrate as a 30-day average, or 0.7 mg/L ammonia) (BC MoE 2012). Although we do not anticipate a resultant bias, it should be noted that the 30-day average values presented in Table 4-3 were calculated from 4 samples (March 15; March 28; April 9;April 15) since the fifth sample was taken on April 29. Although the fifth sample was taken greater than 30 days from the initial sample, it was still during Columbia River low spring flows and period of least dilution. In the 2012-13 data, the only elevated ammonia results occurred at the New Bridge site within the IDZ, and they were most common in April low flow samples (Figure 4-2). Within the transect samples, elevated ammonia concentrations occurred on the Right and Left banks consistent with the general vicinity of the upwelling groundwater plume as shown by geophysical investigation and drive-point sampling (Golder, 2011). Ammonia remained elevated above Birchbank concentrations by an average of 0.0049 mg/L or 59% at the Waneta site, however, both of these averages are affected by the frequent, non-detectable lab results. The ammonia guidelines were not exceeded at any of the sample sites (Table 4-3). Ammonia is converted to nitrate by nitrifying bacteria in the biofilm periphyton coating river substrates (Wetzel 2001).

Table 4-3: Average Nutrient Concentrations at Teck LCR Sample Sites – 2012-2013.

	BC Guideline or LCR Objective mg/L	Results (mg/L)	Birchbank	Stoney Creek	New Bridge	Old Bridge	Waneta
Nitrate (as N)	200 (max)	Mean	0.124	0.125	0.128	0.128	0.126
	40	30-Day Mean‡	0.138	0.138	0.156	0.143	0.141
Ammonia (as N)	0.681 – 27.7	Mean	0.003	0.005	0.018	0.011	0.008
	0.102 – 2.08	30-Day Mean‡	0.001	0.010	0.050	0.017	0.008
TKN*	--	Mean	0.060	0.066	0.082	0.075	0.074
	--	30-Day Mean	0.042	0.074	0.106	0.074	0.066
Phosphorus (as P)	--	Mean	0.004	0.004	0.004	0.004	0.005
	--	30-Day Mean‡	0.004	0.005	0.004	0.004	0.004
Potassium	--	Mean	0.545	0.553	0.567	0.553	0.547
	--	30-Day Mean‡	0.642	0.645	0.758	0.658	0.636
Sulphate	--	Mean	11.303	11.413	13.2792.7	12.064	11.762
	218	30-Day Mean‡	11.3	11.3	19.6	12.6	11.7
TOC*	--	Mean	1.527	1.341	1.280	1.161	1.066
	--	30-Day Mean‡	2.36	1.51	1.54	1.42	1.49

* Only 2013 data available

‡ 30 day mean based on 4 samples from April 2013, not the prescribed 5 samples within 30 days due to sampling constraints

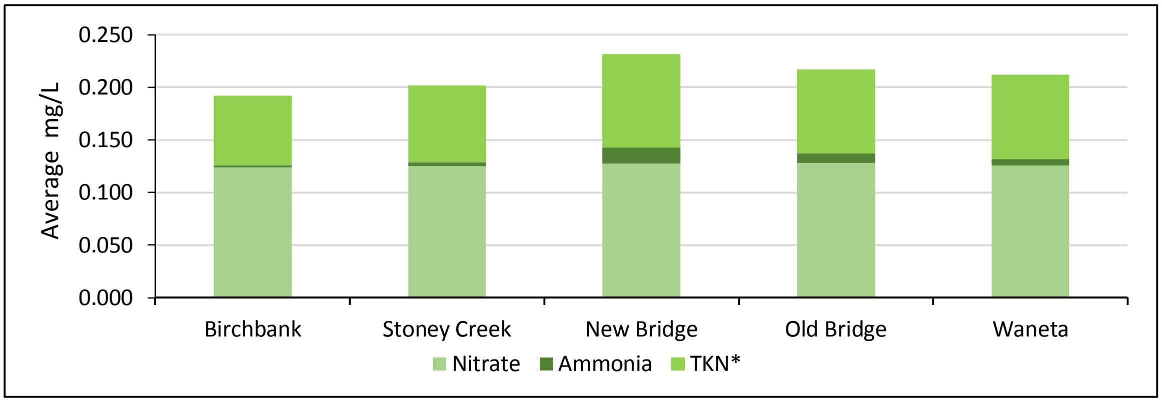


Figure 4-2: Average nitrogen concentrations in 2012 to 2013 samples.*Only 2013 data was available for TKN.

There are numerous sources of inorganic nitrogen within the LCR, including municipal effluents, the BC Hydro lake fertilization programs in upstream reservoirs and stormwater inflows (MacDonald 1997; Can-BC 2008). Both of these inorganic forms of nitrogen account for most of the total nitrogen concentrations (Figure 4-3). The contribution made by organic forms of nitrogen in the AOI is small. They are measured as TKN, along with ammonia. The average total nitrogen concentration in the water at Waneta was slightly elevated above the reference Birchbank site by 10% or 0.02 mg/L.

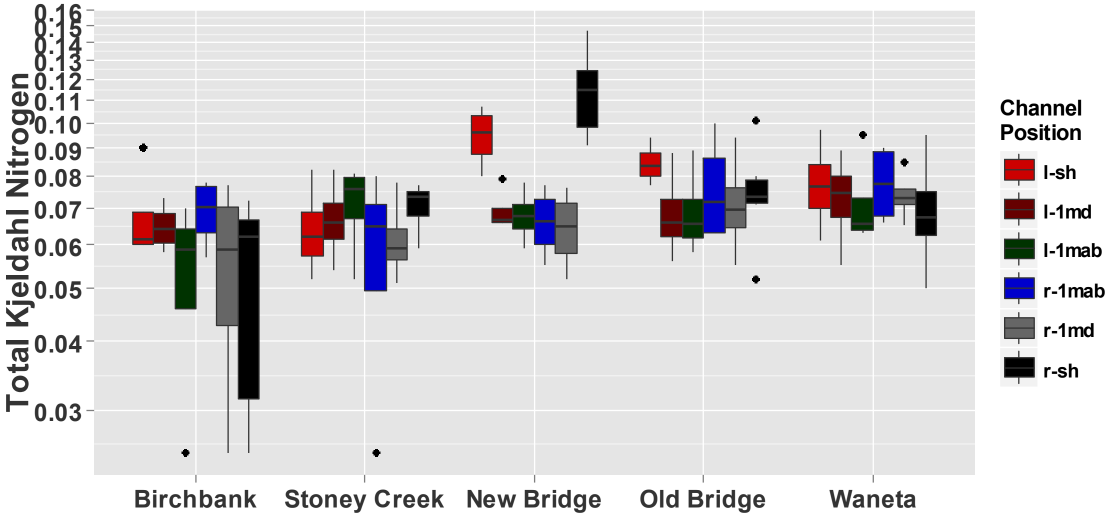


Figure 4-3: Box plots of TKN measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh = left-shallow, L-1md = left 1 m deep, L-1mab = left 1 meter above bed, and the same for Right (r).

Phosphorus

Phosphorus is a key nutrient that usually controls aquatic productivity. Total phosphorus concentrations measured throughout the LCR followed a declining trend over the years, particularly during 1968 - 1978 (Holmes and Pommen 1999; Can.-BC 2008) as outfall water treatment improves throughout the LCR. There is no phosphorus objective set for the LCR.

Total phosphorus within the IDZ was elevated during low flow conditions, particularly in the shoreline samples (0.0032 – 0.0164 mg/L as P) where groundwater emergence is known to occur (Figure 4-4). These elevated samples were still below any relevant guidelines, such as the aquatic life guideline for lakes of 0.005 – 0.015 mg/L T-P.

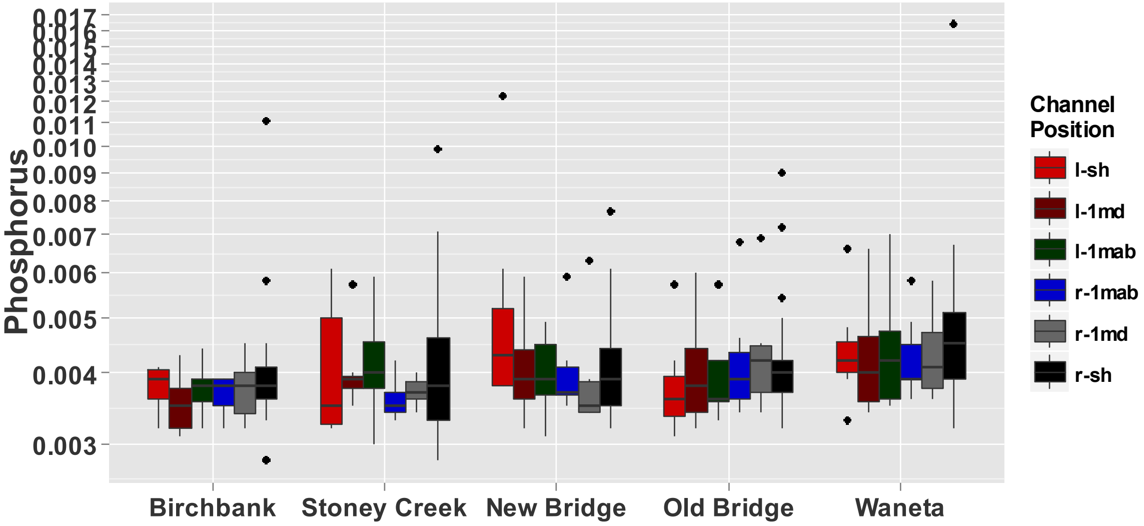


Figure 4-4: Box plot of phosphorus concentrations measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

Minor Nutrients

Potassium is another important nutrient, and like phosphorus, its concentrations were elevated in the IDZ, particularly along the wetted edge adjacent to and opposite the smelter in New Bridge samples, suggesting groundwater contribution (Figure 4-5). There are no BC guidelines or LCR objectives established for potassium. Potassium concentrations had returned to background concentrations by the Waneta site.

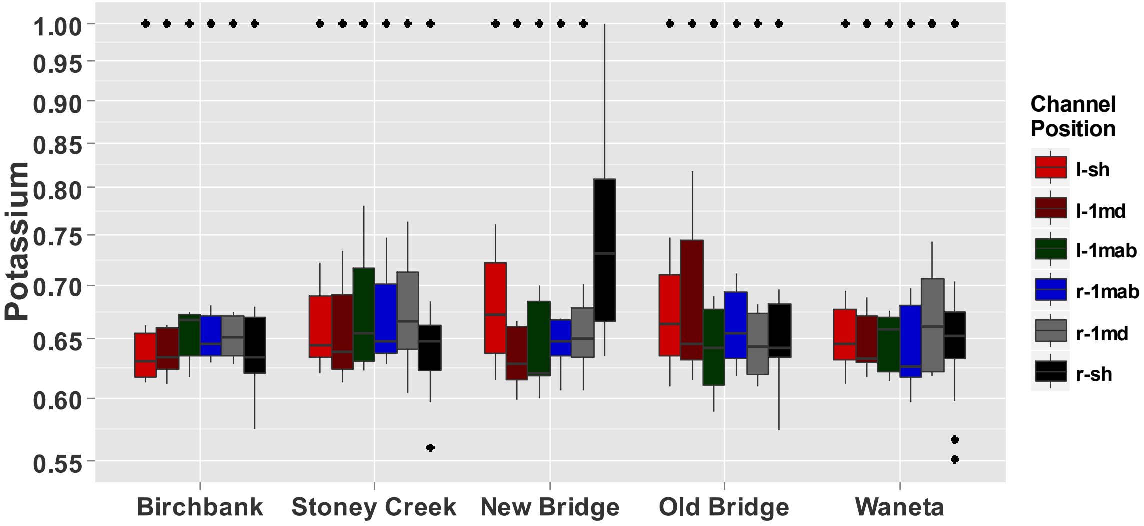


Figure 4-5: Box plot of potassium concentrations measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

Sulphate is used by some algae and bacteria in the periphyton (Wetzel 2001). Sulphate was the dominant anion in the AOI and is a major component of the groundwater plume (Golder 2010). The BCWQG (2005) maximum sulphate guideline for the protection of aquatic life is 100 mg/L and the new 30 day average guideline is 218 mg/L SO_4, based on a typical LCR hardness range of 50 – 80 mg/L as $CaCO_3$ (Meays and Nordin 2013). Neither guideline was exceeded in any samples taken during this study. However concentrations increased at New Bridge along the right bank (avg. 17.0 mg/L SO_4). Sulphate concentrations returned to approximate reference concentrations by Waneta (Figure 4-6).

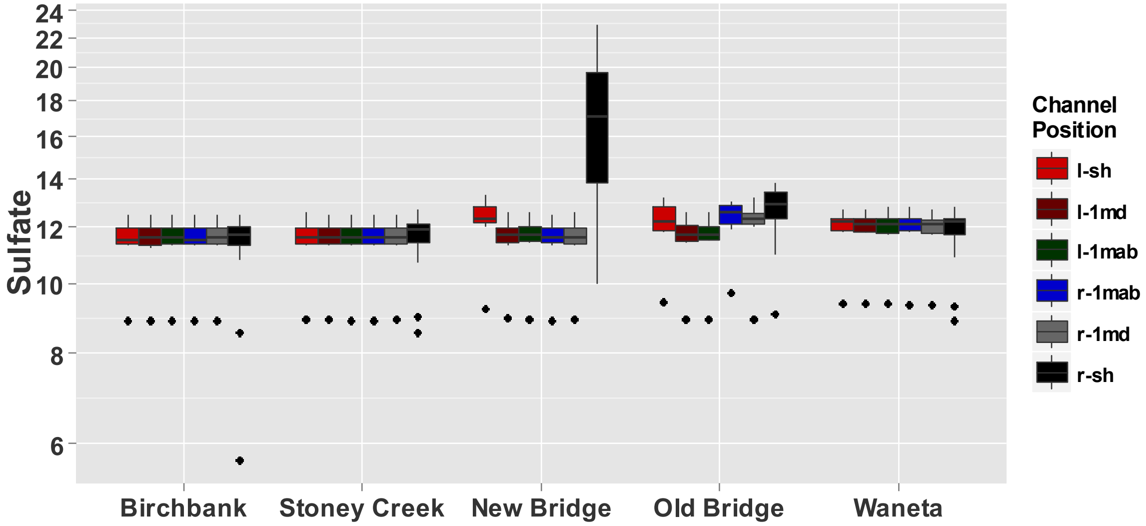


Figure 4-6: Box plot of sulphate concentrations measured in the LCR during low flow periods (2011-2013).

Total organic carbon (TOC) provides an indication of organic material available for food, and for sequestering metals. TOC is generally low in the LCR. The BC guideline prescribes a 30-day median ± 20% of the median background TOC concentration (BC MoE 2001). Objective levels were set at <0.5 – 0.7 mg/L TOC outside the IDZ and <3.5 mg/L within it. TOC ranged from 0.87 mg/L at Waneta to 4.72 mg/L along the right bank at Birchbank. TOC did not increase in exposure sites downstream of the smelter and it was lower than reference concentrations at the Waneta site. TOC sources are greater upstream of the Birchbank reference site than they are below the smelter (Figure 4-7).

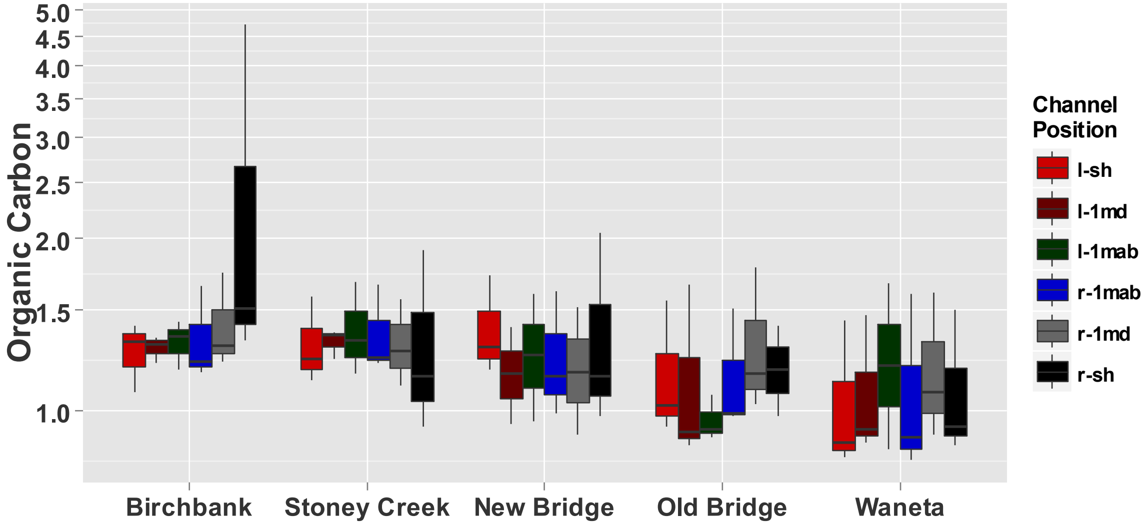


Figure 4-7: Box plot of total organic carbon measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3 Total and Dissolved Metal Concentrations

The choice of transect sampling to detect plume location allowed the calculation of 30-day averages only in the spring low flow period when dilution was low. During the spring low flows. 30-day averages were calculated from 4 weekly samples for the shallow sites by combining the grab and transect data sets over 32 days. The goal of five samples within 30 days was not attained in 2012. Although the fifth sample was taken greater than 30 days from the initial sample, it was still during Columbia River low spring flows and period of least dilution. In this study, evaluation of the LCR objectives was usually calculated from individual samples, rather than the 30 day long-term average.

It is important to remember that guidelines are set at levels that are designed to result in negligible risk to biota, their functions, or any interactions that are integral to sustaining the health of ecosystems and the designated resource uses they support (CCME 2013). Similarly, objectives are site-specific criterion adapted to protect the most sensitive designated water use at a specific location with an adequate degree of safety, taking local circumstances into account (BC MoE). An exceedance of a water quality guideline or objective does not mean that there will be effects on aquatic species. Developing effects benchmarks is a separate exercise and has been conducted by Golder (2003) in the Aquatic Problem Formulation report.

Water quality metals of interest are identified in Table 4-4.

Table 4-4: Matrix for Determining Water Quality Metals of Interest

Metal	Metals of interest identified in previous reports	Near-field sites >> reference sites in 2012 samples	Guideline exceedance during past 10 years in LCR AOI
Aluminum			✓
Arsenic	✓	✓	✓
Cadmium	✓	✓	✓
Chromium	✓		✓
Copper	✓	✓	✓
Lead	✓	✓	✓
Mercury	✓		✓
Nickel	✓		✓
Selenium		✓	✓
Silver	✓		
Thallium	✓	✓	
Zinc	✓	✓	✓

(Previous reports: Golder 2003, Hatfield 2008, Golder 2010)
>> signifies a difference of >50%

The New Bridge site is located within the IDZ where effluents are discharged and elevated metal concentrations are anticipated and permitted. By definition, calculations of exceedances do not involve the IDZ. Many metal concentrations increased downstream of the smelter within the IDZ, but only five metal concentrations were higher than the guidelines. As these five concentrations were within the IDZ, these do not constitute exceedances. Results from the New Bridge site were not included in the exceedance of water quality objectives or guidelines calculations reported in Table 4-5.

Table 4-5: Water Quality Exceedance Distribution by Sample Dates 2012 – 2013 to date in the Area of Interest of the LCR

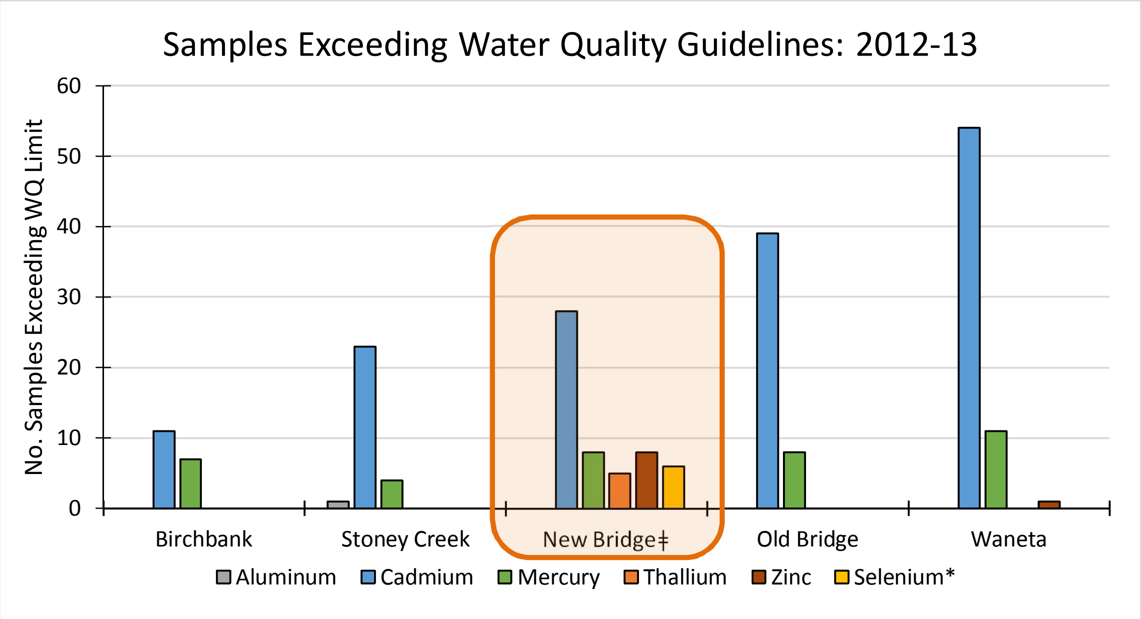
Total Metals	2012							2013						
	28-Mar	3-Apr	9-Apr	15-Apr	27-Apr	26-Jul	25-Sep	18-Feb	14-Mar	28-Mar	9-Apr	15-Apr	29-Apr	25-Jul
Cadmium (BC MoE)	3	3	14	12	4	19	13	10	10	3	3	10	3	20
Cadmium (proposed CCME)	0	0	1	0	0	0	0	1	0	0	0	0	0	0
Mercury	3	2	0	0	4	4	6	0	0	0	0	0	0	15
Zinc	0	0	0	0	0	1	0	0	0	0	0	0	0	0

* Proposed CCME = reference to Canadian Water Quality Guidelines for the Protection of Aquatic Life – Cadmium. The Canadian Water Quality Guidelines for the Protection of Aquatic Life for Cadmium, 1999 has been revised and the draft scientific criteria document is currently under review (CCME).

A summary of the number of exceedances identified in the 2012 – 2013 AREMP study is provided in Figure 4-8. In both the reference and exposure samples, three metals exceeded the LCR Objectives or BC Guidelines outside of the IDZ during this study. They are cadmium, mercury and zinc. At the Birchbank site, cadmium and mercury periodically exceeded guidelines. At the Waneta site, cadmium, mercury and one zinc sample exceeded the guidelines, and mercury concentrations were similar to those at the reference Birchbank site, upstream of the smelter.

Throughout the LCR, cadmium and mercury exceed the BC MoE guidelines for aquatic life (BC MoE 2012; Olsen-Rusello et al. 2011). Additionally, cadmium exceeded the BC water quality guideline in 11 samples from the reference Birchbank site from March 2012 to July 2013 (Figure 4-8). The number of samples exceeding guidelines for total cadmium and mercury increased below the IDZ, suggesting that there may be additional sources downstream of the smelter for these two metals.

Many of the exceedances occurred during the low flow conditions in April and again during late summer/early fall lower flows. Some metals were mostly dissolved such as cadmium while others had an important solid-associated phase such as lead. LCR objectives consider total metal concentrations which are the sum of all phases.



‡ ▢ Initial Dilution Zone

Figure 4-8: Frequency of total metals exceeding LCR objectives or BC MoE / CCME Guidelines for metals with no Objective, calculated from individual samples. Exceedences at the IDZ - New Bridge site do not constitute non-attainment of water quality objectives.

Comparison of total versus dissolved metals

Implementation of metals criteria is complex due to the site-specific nature of metals toxicity and variable metal behavior. Canadian guidelines frequently use total metals which are the sums of dissolved ions and metals associated with particulates or minerals, while the US EPA uses dissolved metals. Some studies have indicated that particulate metals appear to contribute to overall metal toxicity but their contribution is substantially less than that of dissolved metals (US EPA MoU 1993).

All of the figures in this report depict total metal concentrations to align with BC guidelines and LCR objectives, however metals occurring mainly in particulate phases can frequently be considered to have lower potential toxicity. For example, lead and aluminum occurred predominantly in total particulate forms, with a small increase in dissolved lead at the New Bridge site within the IDZ (Table 4-6). Numerous metals occurred predominantly in the dissolved form within the IDZ, including cadmium, copper selenium, thallium and zinc.

Dynamic reactions involving dissolved metals occur at various rates, depending on water pH, redox, temperature, availability of particulates with binding sites, and other parameters. For instance, below the IDZ, dissolved metals that became associated with particulates include cadmium, copper, lead and zinc. In contrast, mercury occurred mostly as total Hg in the IDZ and above, but occurred as dissolved Hg below the IDZ (Table 4-6).

Table 4-6: Distribution metrics for total and dissolved metals of concern in the LCR 2012-2013

	% difference between total and dissolved metals					Pearson's Correlation coefficient for total and dissolved metals				
Metal/Site	**BB**	**SC**	**NB**	**OB**	**WA**	**BB**	**SC**	**NB**	**OB**	**WA**
Aluminum	-54%	-56%	-57%	-56%	-58%	0.67	0.59	0.70	0.70	0.68
Cadmium	-36%	-30%	-7%	-20%	-19%	0.34	0.63	1.00	0.95	0.75
Copper	-22%	-15%	-16%	-23%	-29%	0.36	0.47	0.79	0.83	0.69
Lead	-81%	-87%	-70%	-83%	-83%	-0.16	0.87	0.70	0.91	-0.21
Mercury	-46%	-78%	-64%	18%	22%	0.02	0.04	0.52	-0.07	-0.08
Selenium	-6%	-4%	0%	-4%	-2%	0.78	0.79	1.00	0.96	0.86
Thallium	5%	19%	2%	1%	-1%	0.61	0.48	1.00	1.00	0.99
Zinc	-9%	-17%	-16%	-19%	-18%	0.58	0.65	0.97	0.86	-0.03

Legend: BB = Birchbank SC = Stoney Creek NB = New Bridge OB = Old Bridge WA = Waneta
Positive numbers indicate that the dissolved form averaged higher than the total (particulate) form

The following section discusses the metals that exceeded the current LCR objectives or guidelines within the past decade or within the 2012 – 2013 data. All other metal concentrations met the applicable LCR objectives and guidelines. The complete 2012 – 2013 water quality data set is available in Appendix B.

4.1.3.1 Aluminum (Al)

The general range of total aluminum in North American Rivers is 0.012 -2.25 mg/L (Jones and Bennett 1986) and the Columbia and Kootenay Rivers fall within the lower end of this range. The pH-adjusted maximum BC guideline for the protection of aquatic life is 0.10 mg/L Al (diss., pH >6.5), and that concentration was exceeded in 10% of LCR reference and tributary samples during 2011 (Olsen-Rusello et al. 2011). Most of the reference site water samples with detectable dissolved aluminum were collected during freshet. Throughout the AOI, most of the Al was associated with solids, particularly during freshet. Aluminum occurs naturally in the area associated with alumino-silicate clays (Brown and Bruland 2009). The Birchbank reference site frequently had elevated aluminum concentrations at mid-river positions than the sites downstream of the smelter (Figure 4-9). A declining trend in Al concentrations has been detected throughout the LCR in data collected from 1983- 2005 at Birchbank (Can. BC 2008). In the 2012 – 2013 AREMP data, only one sample obtained on April 27, 2012 at the Stoney Creek sample site had elevated Al. This value is unlikely to be related to the smelter (Figure 4-9), as the elevated sample occurred upsteam of the effluent discharge.

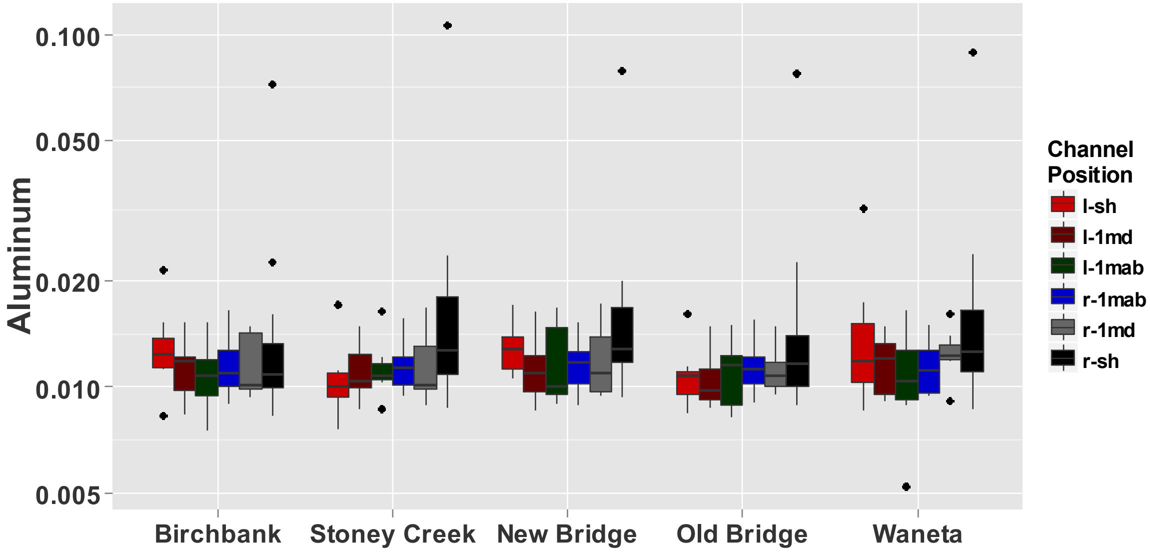


Figure 4-9: Box plots of Al measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3.2 Arsenic (As)

The 30-day average allowable concentration of arsenic has been set at 0.005 mg/L (5 µg/L) T-As as an objective for the LCR and elsewhere to protect fish and aquatic life (BC MoE 2005). Although arsenic concentrations were elevated above background concentrations at sites downstream of the smelter, no samples exceeded the guideline, even within the IDZ (Figure 4-10). At the Waneta site at the lower end of the AOI, average low flow arsenic concentrations remained slightly elevated above the average from the reference Birchbank site by 0.000025 mg/L (or 0.025 µg/L).

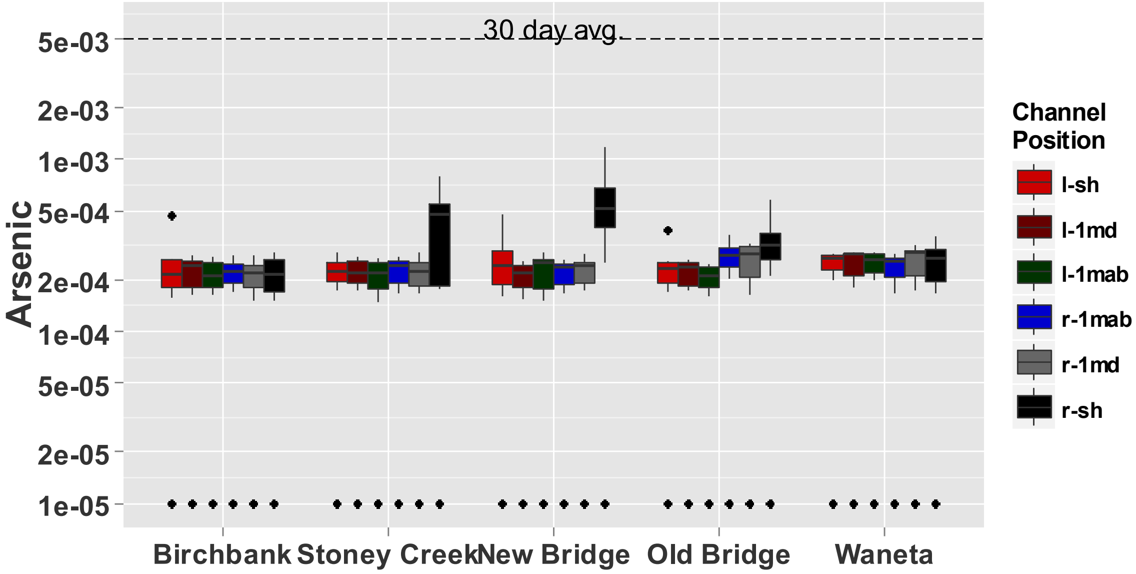


Figure 4-10: Box plots of As measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3.3 Cadmium (Cd)

CCME and BC MoE cadmium guidelines are currently under review and an increase in the acceptable Cd levels are expected. Table 4-8 provides a comparison of the calculated Cd guidelines for a range of water hardness. Using the existing Canadian guidelines, cadmium had the most frequent exceedances in the LCR, usually below the smelter; however, using the draft CCME guideline in Table 4-8, the number of exceedances would be reduced by an order of magnitude.

Cadmium exceeded the LCR objective 30-day average of 0.03 µg/L during April 2013 for all sites downstream of the smelter. Interestingly, the number of Cd exceedances increased downstream of the IDZ, suggesting Cd sources in addition to the current smelter effluents (Figure 4-11). There were 28 Cd exceedances in the IDZ, 39 at Old Bridge and 54 at Waneta (Figure 4-10).

Table 4-8: Comparison of Cadmium Guidelines for LCR Range of Hardness.

Water hardness mg/L as Ca CO_3	Existing BCWQG Total Cd	USEPA Dissolved Cd	Proposed CCME Total Cd
30 mg/L	0.01 µg/L	0.11 µg/L	
60 mg/L	0.02 µg/L	0.17 µg/L	0.12 µg/L
90 mg/L	0.03 µg/L	0.23 µg/L	

NOTE: BC guidelines are based on total Cd while the US EPA uses dissolved Cd. The minimum average hardness of 56 mg/L is typical during freshet, with an increase to 68 mg/L during low flows (BC MoE 1997).

With the existing Cd guidelines, one shoreline grab from the control Birchbank site exceeded the Cd guideline on April 29, and again for most of the July 26 transect. Similarly, at Stoney Creek exceedances of the Cd guidelines and at times the LCR objectives occurred during the April and July low flows. There may be sources of cadmium to the LCR in addition to the smelter. Elevated Cd in the New Bridge left bank samples suggest groundwater influence (Figure 4-11). The highest cadmium values came from New and Old Bridge right bank samples that are within the expected outfall plume path in the IDZ.

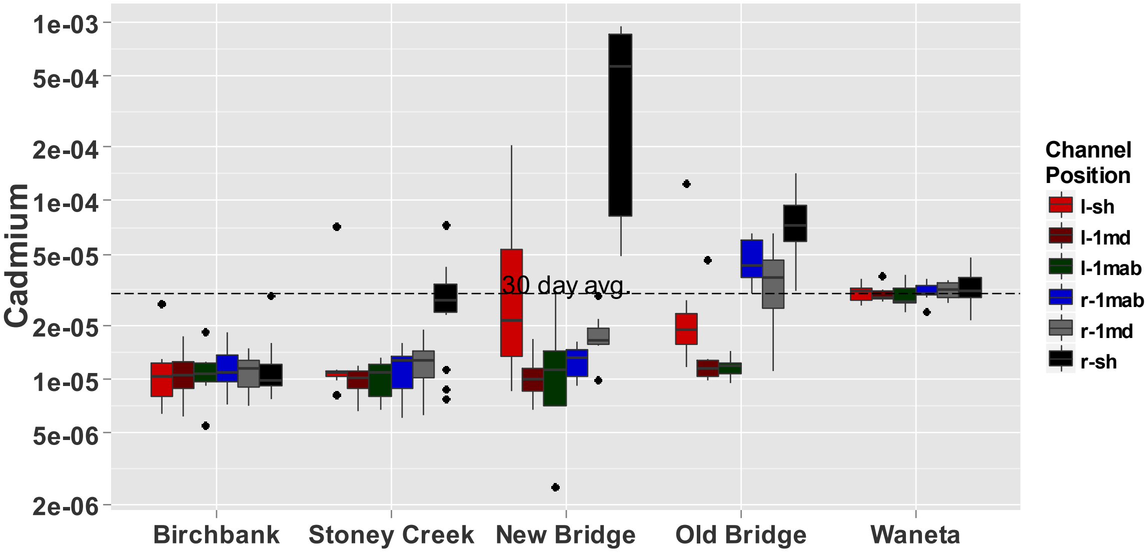


Figure 4-11: Box plots of Cd measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3.4 Chromium (Cr)

A 30-day average LCR objective of 0.001 mg/L (1.0 µg/L) for total chromium was set for the protection of fish and aquatic life. No maximum water quality objective was established (BC MoE 1997). The BC water quality guidelines distinguish between chromium III and chromium VI (Cr^{+3} and Cr^{+6}) and provide maximums of 0.009 mg/L and 0.001 mg/L, respectively. Total chromium concentrations have declined in BC MoE data collected at Birchbank between 1983 and 2005 (Can.-BC 2008). Current average Waneta Cr concentrations were lower than historic concentrations by roughly 0.1 to 0.5 µg/L.

Within the 2012 to 2013 AREMP data set, no exceedances occurred for chromium, including no values above guidelines within the IDZ adjacent to the smelter (Figure 4-12). The Waneta site did show elevated Cr above the reference site, but all values were less than half of the relevant guidelines and objectives.

4.1.3.5 Copper (Cu)

A 30-day average water quality objective of 0.002 mg/L (2.0 µg/L) for total copper was set for the protection of fish and aquatic life in LCR. The maximum water quality objective of 0.00717 mg/L T-Cu (7.17 µg/L) was established for the protection of fish and aquatic life (BC MoE 1997). Although copper concentrations increased on both sides of the river at New Bridge, no copper exceedances were measured at any site in 2012 or 2013 (Figure 4-12). In 2011, only one sample out of 56 exceeded 0.0072 mg/L T-Cu, but it was at the New Bridge site located within the IDZ. Like Cd and Pb, the highest Cu concentrations occurred within the IDZ on both river banks, suggesting a groundwater influence.

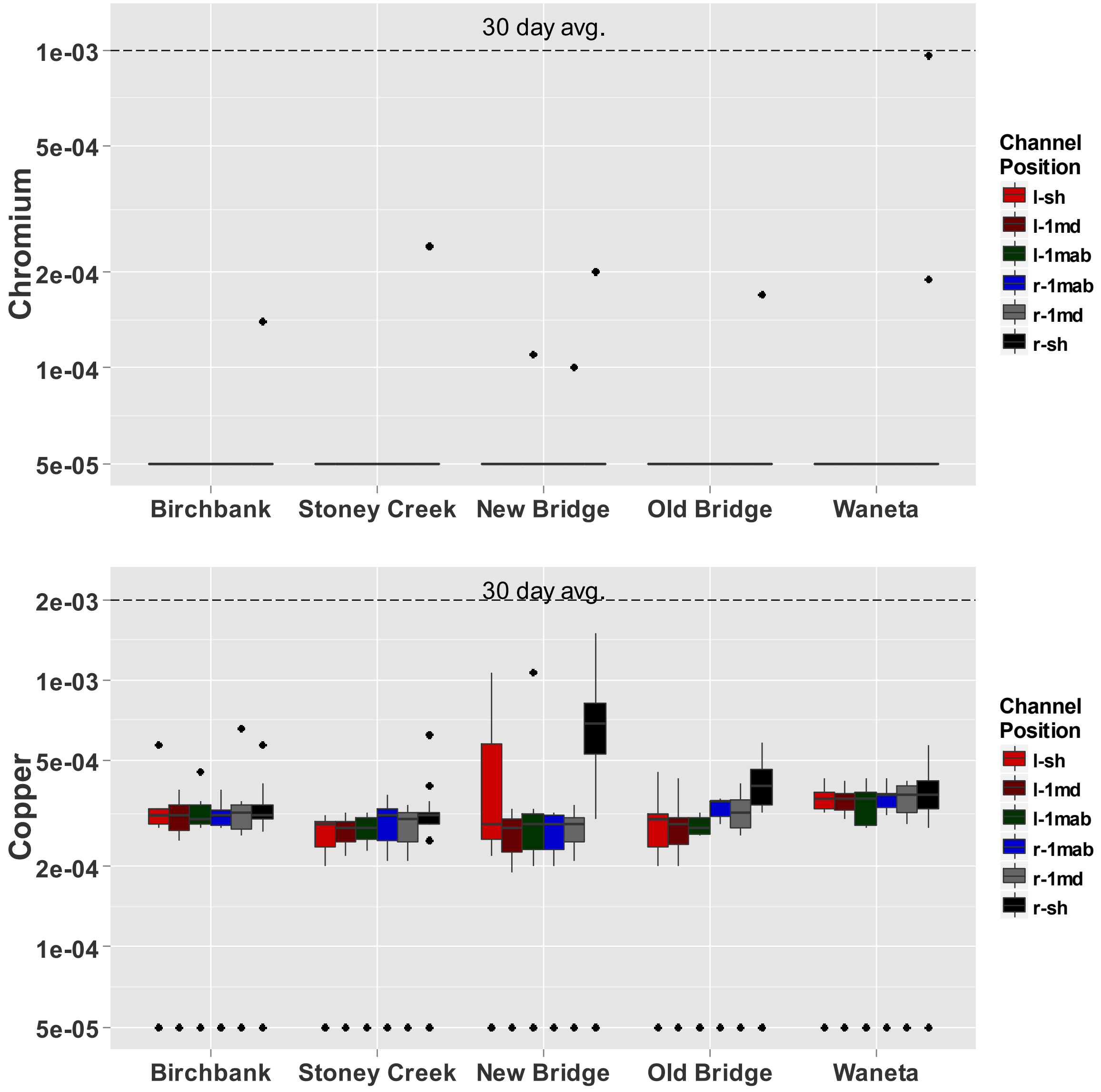


Figure 4-12: Box plots of Cr and Cu measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3.6 Lead (Pb)

Water Quality Objectives for the LCR set the maximum allowable concentration of total lead at 0.0379 mg/L (37.9 µg/L) to protect fish and aquatic life. The 30-day average T-Pb Objective is 0.0048 mg/L (4.8 µg/L). In the 2012 – 2013 transect data, the highest average lead concentrations occurred in right bank samples, potentially reflecting effluent and/or groundwater discharge (Figure 4-13).

Two samples in transects from the New Bridge site did not meet the Pb Objective in 2011 (Golder 2012), but in this AREMP study, no samples exceeded the BC MoE guideline for maximum or 30-day average for lead or the LCR water quality objectives. Average lead concentrations remain slightly elevated at Waneta compared to the reference site. For example, the 30-day Pb averages from spring low flows 2012 ranged from 0.031 µg/L at the reference Birchbank site, to 5.34 µg/L at the New Bridge IDZ, and 1.09 µg/L at the Waneta Eddy site (Figure 4-13). Again, all of these values were lower than the maximum allowable concentration objective, and only one value fell above the 30-day average.

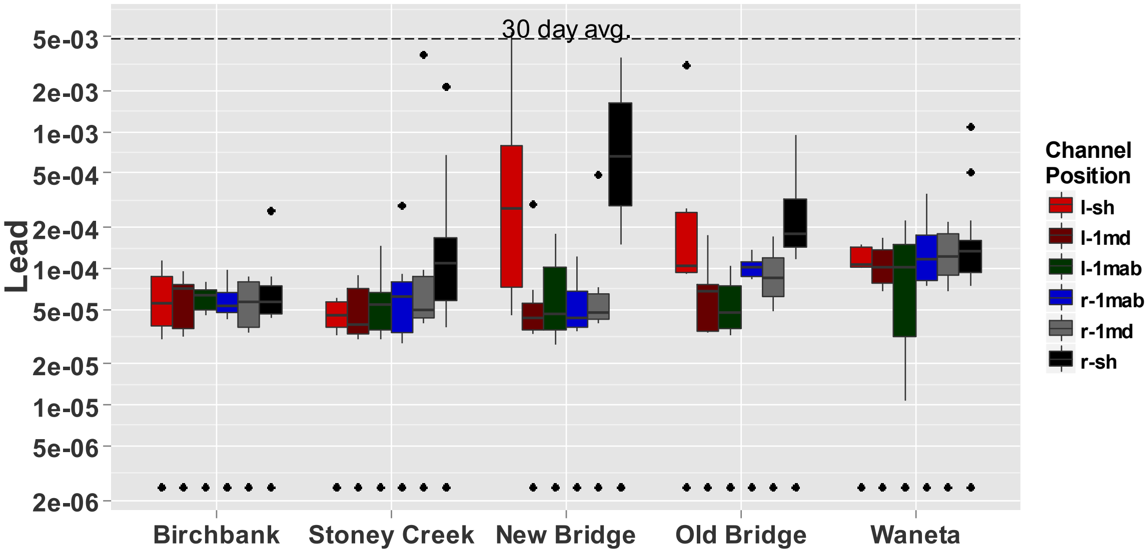


Figure 4-13: Box plots of Pb measured in the LCR during low flow periods (2011-2013). The channel position designations are L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right

4.1.3.7 Mercury (Hg)

No water quality objective for mercury was set for the LCR. The BC WQ Guideline (2005) maximum for total mercury was set at 0.0001 mg/L (0.1 µg/L), with a 30-day average guideline of 0.00002 mg/L T-Hg (0.02 µg/L). Like aluminum and cadmium, mercury concentrations exceeded the BC guideline both above and below the smelter. Mercury concentrations were elevated above reference levels in the IDZ, and remained slightly elevated at the Waneta site (Figure 4-14). A very small increase in total mercury occurred beyond the IDZ. Total mercury increased from roughly 0.66 ± 1.5 SD µg/L in the IDZ to 0.53 ± 1.0 µg/L at Waneta.

4.1.3.8 Nickel (Ni)

The hardness calculation-based maximum BC water quality guideline of 0.0025 – 0.105 mg/L T-Ni (2.5 - 105 µg/L) was established for the protection of fish and aquatic life. No exceedances were detected in any 2012 – 2013 samples collected above or below the smelter in the LCR area of interest including within the IDZ (Figure 4-14). No impact from the smelter on Ni concentrations was detected in the 2012 to 2013 samples. Further, there was no detectable difference between the Birchbank and Waneta sites.

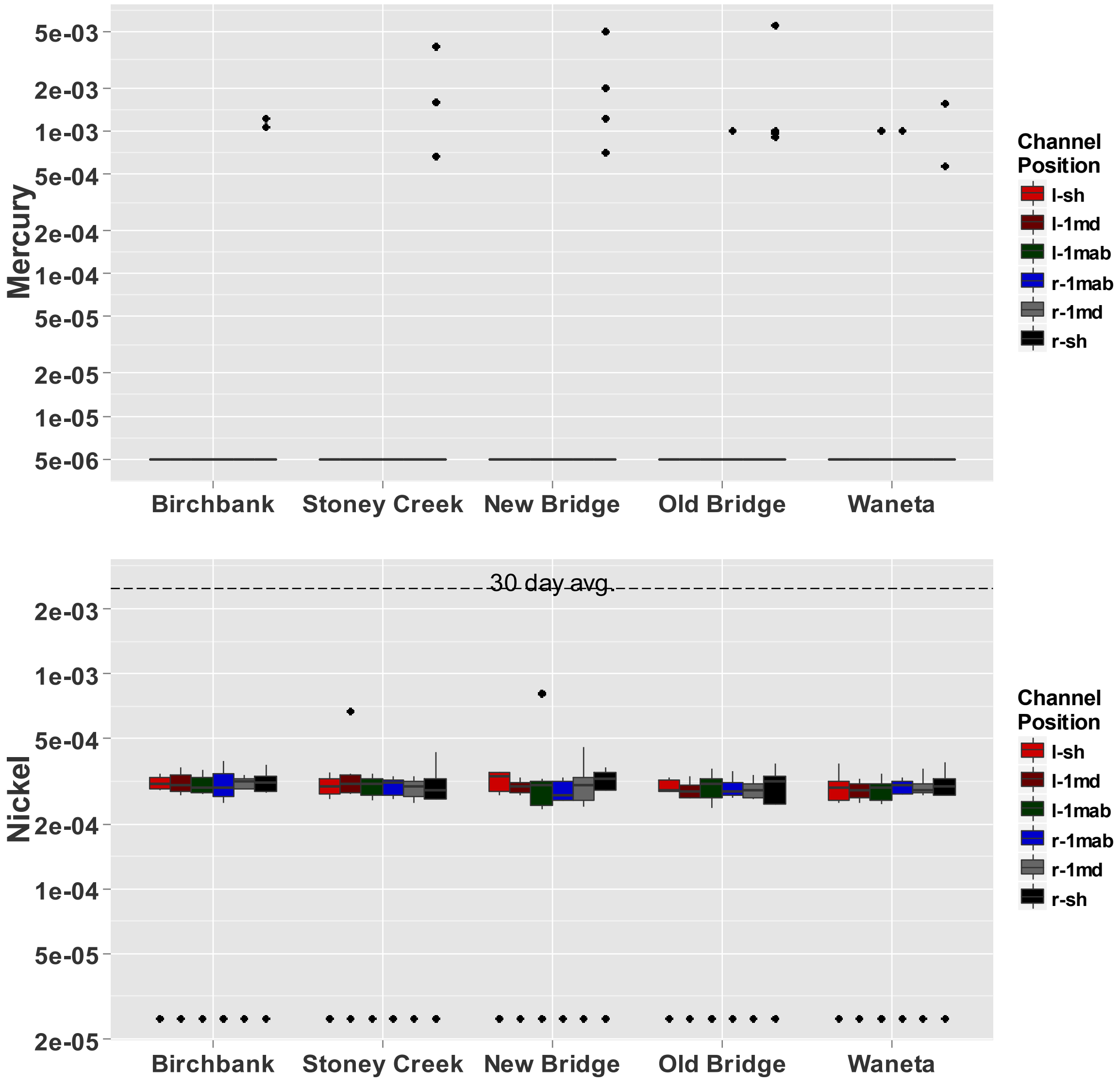


Figure 4-14: Box plots of Hg and Ni, measured in the LCR during low flow periods (2011-2013). The channel position designations are: L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right

4.1.3.9 Selenium (Se)

A maximum water quality guideline of 0.001 mg/L T-Se (1 µg/L) has been set by CCME and the 30-day maximum set by BC MoE is 2 µg/L T-Se for total selenium. Selenium exceedances occurred most frequently in the February/March/April low flow period (Table 4-5). Sites with the highest Se concentrations were New Bridge (within the IDZ) and Old Bridge on the edge of the IDZ, particularly along the right bank in the plume path (Figure 4-15). Elevated selenium concentrations within the IDZ do not constitute exceedances. No selenium exceedances outside the IDZ were detected in the March 2012 to July 2013 data. Selenium concentrations were still slightly elevated above the reference Birchbank site at Waneta by an average of 0.08 µg/L (0.00008 mg/L).

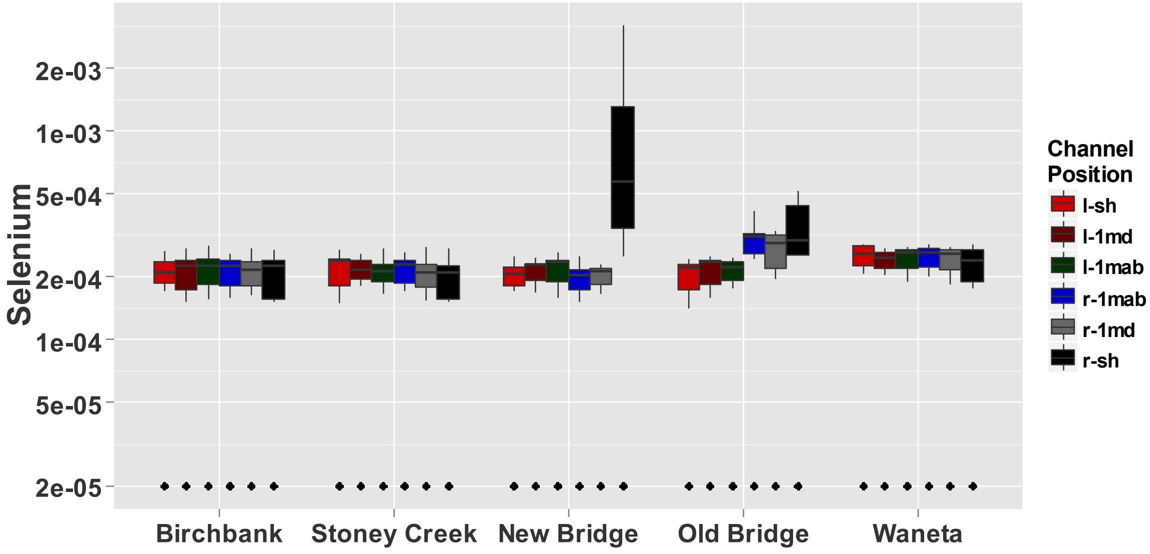


Figure 4-15: Box plots of Se measured in the LCR during low flow periods (2011-2013). The channel position designations are: L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right.

4.1.3.10 Silver (Ag)

The BC maximum guideline for silver is hardness-dependent. For waters with hardness <100 mg [$CaCO_3$]/L, a maximum 0.0001 mg/L T-Ag (0.1 µg/L), and a 30-day mean of 0.00005 T-Ag (0.05 µg/L) was recommended by BC MoE (1997) for the protection of fish and aquatic life. No samples from the LCR exceeded either guideline in the 2012 – 2013 data set.

4.1.3.11 Thallium (Tl)

A provisional LCR water quality objective for thallium of 0.0008 mg/L T-Tl (0.8 µg/L) in 30-day averages was recommended by BC MoE (1997) for the protection of fish and aquatic life.

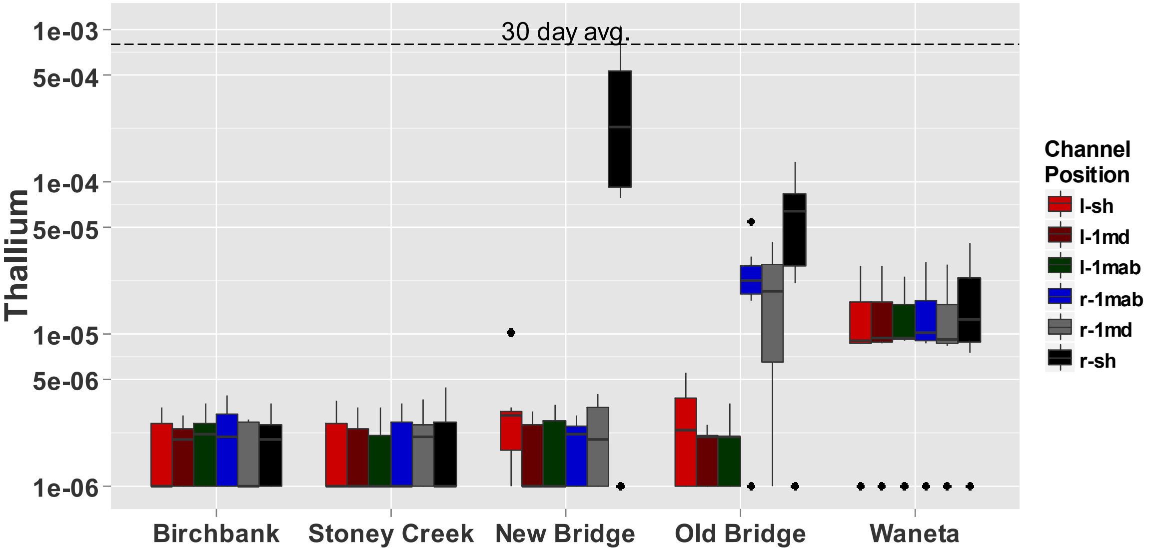
In 2012 and 2013 water quality data, the only site to show concentrations above the provisional thallium guideline was New Bridge which is located within the IDZ. No exceedances were observed below the IDZ (Figure 4-16). Most of this Tl was in the dissolved form. Tl was elevated at Waneta by 60% but a very small amount (0.012 µg/L), compared to the reference Birchbank site (0.017 µg/L).

4.1.3.12 Zinc (Zn)

In the water quality objectives for the LCR, the maximum allowable concentration of zinc has been set at 0.007 mg/L (7 µg/L) to protect fish and aquatic life and other water uses (BC MoE 2005). There is no 30-day average Zn objective. For BC MoE 2005 guidelines, the zinc calculation is based on water hardness so that Zn max = (33+0.75(hardness-90))/1000 and Zn avg = (7.5+0.75(hardness-90))/1000.

In the 2012 to 2013 data set of 56 samples, 9 elevated Zn values occurred at the New Bridge within the IDZ (Figure 4-16). Similarly, there were 3 samples in transects from New Bridge that did not meet the Zn objective in 2011 (Golder 2012). Zinc values were highest along the right bank within the IDZ.

The number of zinc exceedances in 2012/2013 was far below the number that occurred in the decade prior to the numerous smelter upgrades (McElligott et al., 2001b, G3 2001, Golder 2007a).



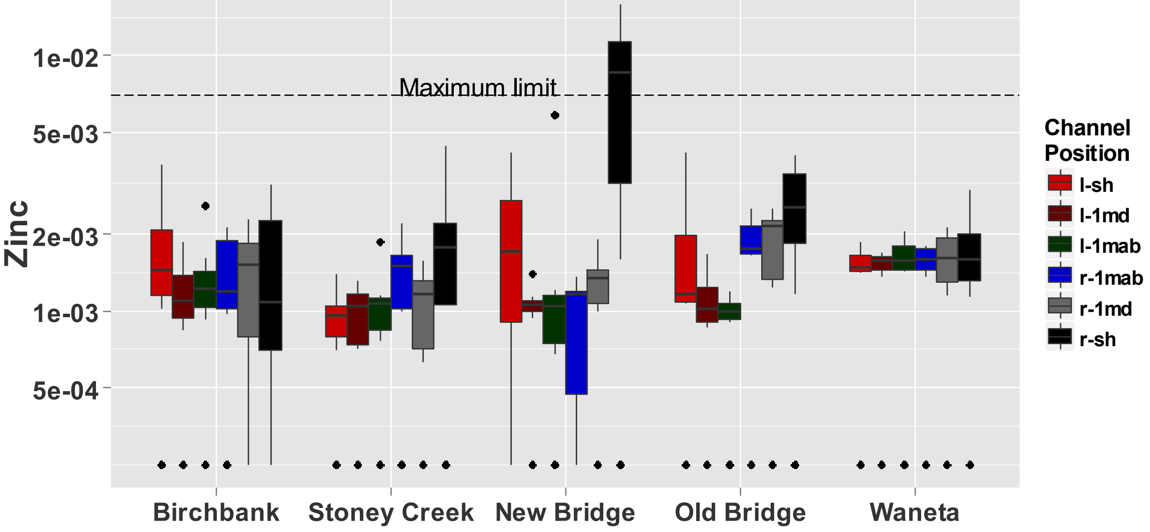


Figure 4-16: Box plots of Tl, Zn measured in the LCR during low flow periods (2011-2013). The channel position designations are: L-sh left-shallow, L-1md left 1 m deep, L-1mab left 1 meter above bed, and the same for Right

4.1.4 Quality Assurance and Quality Control

In ultra-low metals detection, a small discrepancy between duplicate samples causes a relatively large percentage difference that can exceed the QC assessment criterion of 50%. Discrepancies between the duplicates were flagged to ALS Labs and resulted in four re-runs for selected parameters in the September 2012 to July 2013 data. (e.g., Feb 19 2013 Pb; Apr 15-16 2013 Fl, NO_3, SO_4; Jul 25 2013 TKN, Cd, Pb). Overall, the QA/QC assessment (Appendix L) indicated high field and analytical precision for the 2012-2013 AREMP water quality monitoring program.

Resulting analytical values were suitable for addressing water quality objectives of this study. The residual analytical discrepancies do not interfere with interpretation of data.

4.2 Depositional Sediment Quality

The hydrodynamics of the Columbia River in the study area create conditions where long-term depositional zones are expected to be rare (Golder 2003). The spatial extent of depositional habitat in the LCR is small. Depositional sediments account for approximately 33 ha or 2% of the total area of the LCR between HLK Dam and the Canada - US border. In the study area, the area of depositional habitat was estimated at 0.1% of the total sediment habitat (Golder 2007a). The importance of these depositional areas is restricted by their small contribution to the overall LCR habitat.

The length of time that deposited materials remain in the depositional areas is also important. If most depositional zones are short-term with frequent re-suspension during high flows, then there will be less opportunity for metals to accumulate and be retained than if the depositional zones are longer-term (Wetzel, 2001). Larger depositional sites such as Waneta can be expected to have longer sediment storage than small depositional sites (Vietz, et al. 2006).

Each small depositional site had its own character in contrast to the relatively uniform erosional habitats. For example, the Korpac site can be affected by Trail Creek (carries urban runoff) and Ryan Creek (affected by historic mining of ore bodies in its watershed) (Table 4-9). Maglios and Waneta sediments produced high-magnitude responses in sediment toxicity tests (Golder 2010). Sequential metal extraction from depositional sediments showed that the overall potential for release of copper, lead and zinc from sediments was higher at Maglios, Fort Shepherd and Waneta, in that order (Golder 2007, 2010). Depositional areas may reflect the influences of historical practices such as slag deposition as well as current effluent discharges and other inputs. These influences must be considered when interpreting the sediment and benthic community results collected in this study.

4.2.1 Sediment Condition and Composition

At the depositional sites, coarser substrates were often encountered below 20 – 50 cm of surficial substrates. It was assumed that these deep sediments were stable and less likely to interact with river ecosystems and therefore were of less interest than the surficial sediments that are discussed below.

Sediment composition measured at the same LCR sites was variable between years, almost certainly as a function of flow regime. The amount of fines in depositional sites in the silt/clay fraction were generally low, ranging from 0.7 to 36% (Hatfield 2008), 3 – 23 % (Golder 2003) and <1 – 9% in this study, perhaps as a function of two recent freshets that set flow records. In all studies, the dominant material in the depositional areas was coarse sand (Table 4-10). Depositional sediments are dynamic.

It is unlikely that the sediment sample sites and depths within a depositional area were precisely matched between the 2003 and 2012 sampling campaigns, but comparing the particle size data from both years showed that sand-sized particles (0.25 – 2 mm) dominated all depositional sediment samples in both years, and suggests that the percentage of fines measured in 2003 was greater before the record 2011/2012 freshets than it is currently (Table 4-10).

Depositional sites where percent fines and organic carbon have decreased since 2003 include: Kootenay Eddy, Korpac, Casino, Trimac, and Fort Shepherd. Sites where percent fines and organic carbon have increased since 2003 include Maglios and possibly Waneta (Table 4-10). The percentage of fines versus coarse particles may help explain the elevated sediment metals in Maglios samples. Sites with higher proportions of fines in 2012 were Maglios 9%, Birchbank Eddy 7%, Airport Bar <7% and Trimac <7%.

A large contributor of organic material to sediments is aquatic plants such as milfoil (*Myriophyllum spp.*) and pondweed (*Potamogeton spp*.). The decline in aquatic plant density at all LCR depositional sites (with the possible exception of Waneta) from 2003 to 2012 indicates the unstable nature of these depositional areas which probably scoured during the very large 2011 and 2012 freshets.

The depositional sediment samples will inevitably include some periphyton that could increase the sediment to periphyton correlation. However, total organic carbon concentrations in these samples were very low, ranging from 0.57% at Waneta to 0.09% at Maglios (Table 4-10). TOC may be declining over time because earlier studies estimated 0.02 – 1.8% (Hatfield 2008) and <0.5 – 1.38% (Golder 2003).

Table 4-9: Sediment composition and field meter readings at the depositional sediment sampling sites in 2012 with comparison to 2003 (Golder) results.

	Reference Sites				Exposure Sites													
	Dep Ref 1		Dep Ref 2		Dep Exp 1		Dep Exp 2		Dep Exp 3		Dep Exp 4		Dep Exp 5		Dep Exp 6		Dep Exp 7	
	Kootenay Eddy		Birchbank Eddy		Korpac		Maglios		Casino		Airport Bar		Trimac		Ft Shepherd		Waneta	
	2003	2012	2003	2012	2003	2012	2003	2012	2003	2012	2003	2012	2003	2012	2003	2012	2003	2012
Field Measured Parameters																		
Conductance µS/cm	180	152	150	143	150	135	150	133	150	133	150	131	160	133	130	125	160	134
pH	8.6	7.52	8.6	8.01	8.7	7.79	8.5	7.6	8.4	7.66	8.6	8.03	8.7	7.54	8.4	7.86	8.4	7.98
Water temperature °C	16.4	14.57	15.6	13.87	15.5	13.43	15.4	13.41	14.9	13.37	15.3	13.38	15.7	13.32	14.9	13.53	16	13.52
Dissolved oxygen mg/L	8.9	9.33	8.2	8.96	8.1	9.43	8.1	9.46	7.8	9.38	7.9	9.39	8.9	9.28	8	9.1	7.8	9.01
Pore water Redox mv 0-10 cm depth		-45 to -135		-30 to -280		-70 to -190		-80 to -90		-20 to -185		-40 to -175		-155 to -295		-10 to -30		-35 to -125
Pore water Redox mv 15+ cm depth		-75 to -165		-30 to -50		-20 to -5		-65 to -110		-130 to -140		-140 to -350		-125 to -325		-335		-5 to -20
Macrophyte % cover	60	<1	10	0	10	0	0	<1	20	10	10	0	75	25	75	<1	0	10
Lab Measured Parameters																		
% sand	85	98	77	94	75	98	96	92	90	97	77	95	77	95	94	99	81	100
% silt	11	<2	4	5	6	<2	4	7	8	2	4	5	29	5	4	<2	3	<2
% clay	2	2	2	2	2	2	1	2	2	2	2	<2	4	<2	2	<2	0	<2
Total organic carbon mg/L	0.75	0.35	<0.5	0.11	<0.5	0.22	<0.5	0.09	<0.5	0.26	<0.5	0.21	1.38	0.14	<0.5	0.2	<0.5	0.57
Slag – estimate %	0	ND	0	ND	0	ND	40	possible 1%	10	ND	10	ND	0	ND	30	possible <1%	90	possible <1-5%

Casino Elodea>Myriophyllum>>pondweed
Trimac Elodea>Potamogeton
Waneta Elodea>>Potamogeton>milfoil (deep)

ND = Not detected

In sediment sampling, a strong correlation between decreasing grain size and increasing metal concentrations is expected, making comparison of samples dominated by a sand fraction with one dominated by a silt fraction inappropriate (Wisconsin DoNR, 2003). Since 2012 sediment samples from reference sites contained >94% sand, and the exposure sites contained >92% sand, the reference and exposure samples can be compared.

Field observations and microscope evaluations are summarized in Table 4-11. The microscope evaluation of the depositional sediments confirmed that the contribution made to the biofilm by algae was small compared to erosional periphyton biofilms, while the contribution made by bacteria and organic debris was much greater (Table 4-10). All of these depositional sediment components exert an influence on metal concentrations and bioavailability at LCR depositional sites.

It was very difficult to determine slag presence in the field and even with a microscope, differentiating between slag and other dark particulates was challenging, and results should be interpreted with caution. Assumptions made in earlier reports based only on visual inspection in the field should be interpreted with great caution. Thus, field visual slag identification and microscopic identification of residual slag remaining in the LCR area of interest (AOI) is tentative at best (Figure 4-17). With these limitations in mind, estimates of the percent contribution of slag in the depositional sediments were higher in 2003 than microscope estimates from 2012 in the AOI.

Table 4-10: Microscope evaluation of depositional sediments from the LCR AOI in October 2012.

Components of Samples	Dep Ref 1	Dep Ref 2	Dep Exp 1	Dep Exp 2	Dep Exp 3	Dep Exp 4	Dep Exp 5	Dep Exp 6	Dep Exp 7
	Kootenay	BirchBank	Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta
Field observations	sand>> gravel >organics >pebble	woody organics, H_2S low redox fine sand>sand> >>gravel	orange coarse sand	coarse black sand, particles look like slag	sand>> gravel >organics	Possible slag, fine sand > sand >> organic, H_2S	Fine sand>>sand >> organic no slag seen	Fine sand >> sand >> organic very little slag seen	Slag possible sandy
Microscope observations									
slag	ND	ND	ND	possible 1%	ND	ND	ND	possible <1%	possible <1-5%
dark silt	ND	ND	ND	ND	ND	L	L	L	L
diatoms	VL	P	P	L	P	L	L	VL	L
cyanobacteria (coccoid)	ND	L	L	M	L	M	M	L-M	C
fungal filaments	ND	NND	ND	ND	P	ND	ND	ND	ND
pollen	ND	ND	ND	ND	ND	ND	ND	ND	P
Didymo tubes	ND	ND	ND	ND	ND	ND	ND	P	VL
bacterial	VL	M	slime	L	VL	C	C	C	C-D
vascular debris	L	ND	ND	ND	ND	ND	ND	P	L
organic debris	C	M	M	L	C	C	C	C	C
protozoa invertebrates	P	ND	ND	ND	ND	ND	ND	P	ND

Key to Frequencies	Not Detected	ND	not seen	0%
	Present	P	rarely seen	<1%
	Very Low	VL	seen infrequently	1-3%
	Low	L	seen periodically	3-5%
	Moderate	M	seen often	5-10%
	Common	C	seen in all screens	10-20%
	Dominant	D	seen most often	>20%

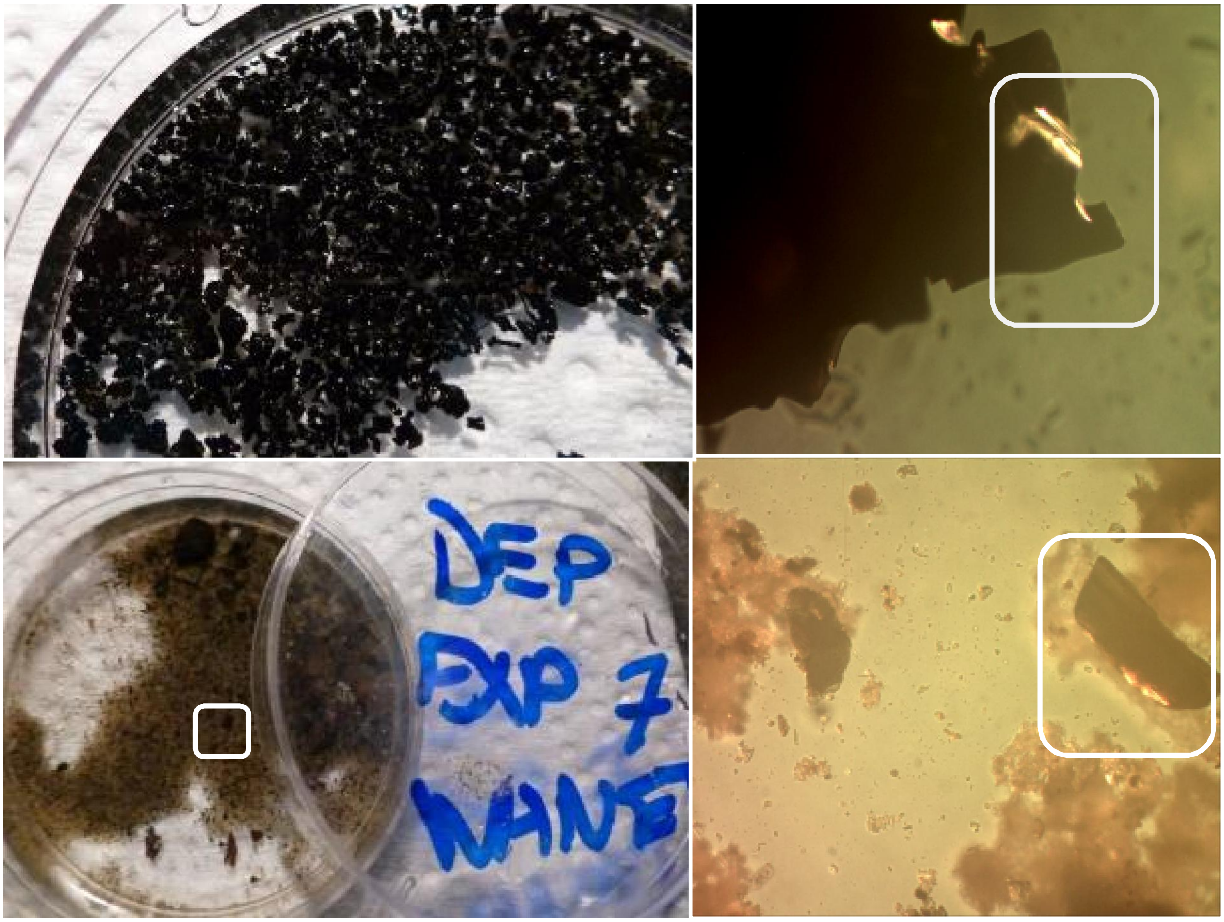


Figure 4-17: Photographs and microscope images for fresh slag (upper) and sediment from Waneta Eddy depositional exposure site (lower) with possible slag particles outlined.

4.2.2 LCR Sediment Metal Content

In the Lower Columbia River, sediments are confined to small depositional areas and to a much lesser extent, interstices between cobbles in erosional areas.

Whole, composite sediment samples (excluding >2 mm) were subjected to sediment digestion using the strong acid leachable method, which is intended to dissolve those metals that may be environmentally available. All of the 2012 results reported here were treated this way.

Sediment guidelines are generally stated in two ways: safe levels of substances that will protect aquatic life from adverse effects of toxic substance (ISQG), or levels which, if exceeded, can cause severe effects on aquatic life (PEL). These guidelines are not based on cause-effect studies, but on levels of toxic substances found in the sediment where biological effects have been measured. Therefore, caution should be exercised in the application of these working guidelines.

Canadian sediment quality objectives and guidelines are deliberately set to be protective, therefore, if concentrations of metals of concern are less than the established objectives, potential risks to the receptor groups can be ruled out with confidence. Further, elevated sediment metals do not necessarily indicate effects to the resident plant and animal communities. Depositional sediment samples will include adsorbed forms with limited bioavailability. Clearly, sediment metal concentrations, pore water concentrations, and bioavailable metal concentrations are linked, but they are not necessarily similar in scale.

An important consideration in LCR sediment studies in the AOI is how metal concentrations have the potential to adversely affect the LCR aquatic food web.

For this study, sediment metals of concern were defined as those that either:

- identified as metals of concern in earlier studies (Golder 2003, Hatfield 2008, Golder 2010)
- those that had sediment concentrations at near-field sites that were statistically significantly higher than at reference sites
- metals that exceeded sediment guidelines at depositional sites downstream of the smelter from 1992 - 2012

The resultant metals of interest are identified in Table 4-11.

Table 4-11: Matrix for Determining Sediment Metals of Interest

Metal	Metals of interest identified in previous reports	Near-field sites >> reference sites 2012 samples	Guideline exceedences for sediment in past 20 years
Aluminum		✓	
Arsenic	✓	✓	✓
Cadmium	✓	✓	✓
Chromium	✓	✓	✓
Copper	✓	✓	✓
Iron		✓	✓
Lead	✓	✓	✓
Manganese		✓	✓
Mercury	✓	✓	✓
Nickel	✓	✓	✓
Selenium		✓	
Silver	✓		✓
Thallium	✓	✓	
Zinc	✓	✓	✓

(Golder 2003, Hatfield 2008, Golder 2010)

>> signifies a difference of >50%

In this report, we considered all of the potential metals of interest, but focused on those most likely to have potential adverse effects and that could have originated in releases from the smelter. Several of the metals listed in Table 4-12 have other important drivers of their distributions. For example, iron and manganese are very common and are mobile in anaerobic sediments. Aluminum is also prevalent throughout the LCR. Some metals such as silver exceeded guidelines much more frequently in the past than they did in samples from the last decade, and there were no exceedences in the 2012 data.

Table 4-13 provides a comparison of reference sample sites and exposed sites. It is clear that the overall metal concentrations increase in depositional sediments downstream of the smelter. The average percent difference in surface sediment metal concentrations between depositional reference sites and depositional exposure sites exceedances are illustrated in Figure 4-18 and Table 4-12.

Table 4-12: Average and standard deviation for depositional sediment samples (mg/kg dry) from upstream reference sites and downstream exposure sites collected in 2012.

Number of samples	3	7
Sediment Sample Site	DEP-REF	DEP-EXP
Total Organic Carbon	0.32 ± 0.20	0.24 ± 0.16
Aluminum	3700 ± 610	6586 ± 977
Arsenic	0.833 ± 0.25	8.5 ± 3.2
Cadmium	0.207 ± 0.11	0.973 ± 0.43
Chromium	16 ± 1.7	28.9 ± 6.7
Copper	5.4 ± 1.2	287.1 ± 196
Iron	11667 ± 1155	30375 ± 11250
Lead	7.5 ± 2.5	111.1 ± 42.8
Manganese	133 ± 15.3	500 ± 270
Mercury	<0.5	0.126 ± 0.06
Nickel	8.3 ± 1.9	12.1 ± 3.0
Selenium	<0.5	0.76 ± 0.17
Silver	<0.2	1.9 ± 1.7
Thallium	<0.1	0.217 ± 0.10
Zinc	59.7 ± 18.8	1794.3 ± 1262

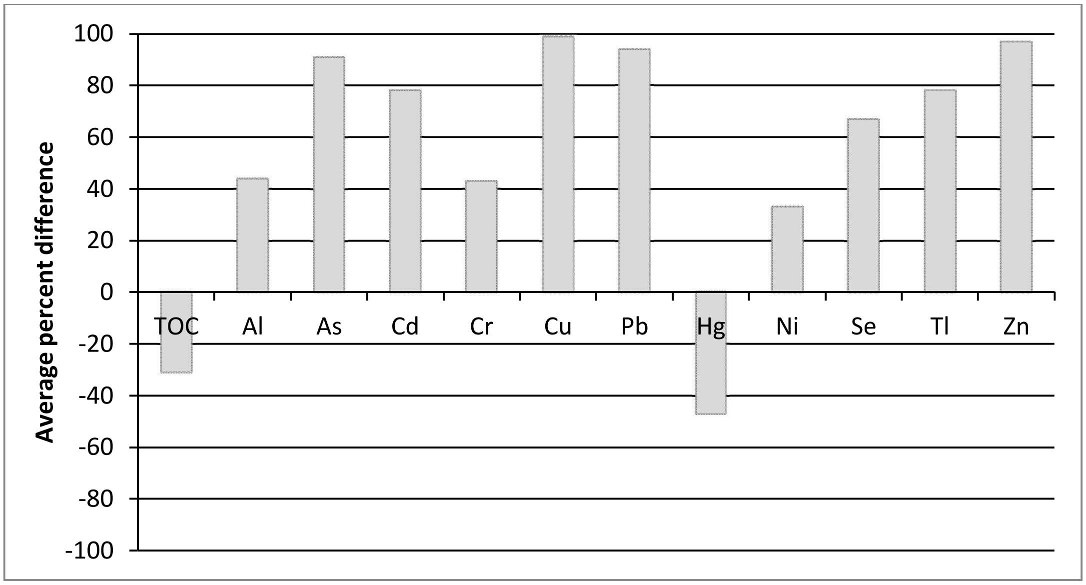


Figure 4-18: Average percent difference in surface sediment metal concentrations between depositional reference sites and depositional exposure sites collected from the LCR in the October 2012 low flow period.

Figure 4-18 compares the percent difference between the average of the reference sites and the average of the exposure sites. Like earlier studies on the Lower Columbia, this study shows large and correlated differences for zinc, copper and lead, and to a lesser extent, Cd and As when all sample sites are considered. At depositional sites downstream of the smelter, sediment concentrations of Zn, Pb and Cu exceeded the reference site average concentrations by 2 standard deviations (Table 4-12). Additionally, average metal concentrations where exposure sediments exceeded reference sediments by 1 standard deviation include Al, As, Cd, Cr, Mn and Fe. Of these, local high elevation creek sediments from Blueberry, Murphy, Hanna, and Topping reference creek sites have concentrations comparable to the depositional sites downstream of the smelter for lead (104 mg/kg Pb) and copper (83 mg/kg Cu), while estimated local natural background tributary sediment arsenic (10.6 mg/kg As) and cadmium (3.6 mg/kg Cd) concentrations frequently exceed the concentrations in depositional sediments downstream of the smelter (Reyes, 2004). Thus, some of the elevated metal concentrations in sediments downstream of the smelter should not be automatically attributed to past or present smelter activity.

When only the exposure sediment sites are considered, the correlation between zinc and copper was very high at Pearson $R^2 = 0.96$ but lead was not correlated to the other two metals. A statistical cluster of metals including zinc, copper, iron and arsenic was apparent in this study, as well as earlier studies (Golder 2007, Hatfield 2008).

Other Sediment Metals of Interest

Figures 4-19 to 4-22 illustrate concentrations of other metals of interest measured in the sediments collected from three reference sites (Kootenay Eddy, Genelle, and Birchbank) and 7 downstream exposure sites (Korpak, Maglios, Casino, Airport Bar, Trimac, Fort Shepherd Eddy, and Waneta). Where they exist, published guidelines are indicated on each figure to illustrate where exceedances may have occurred.

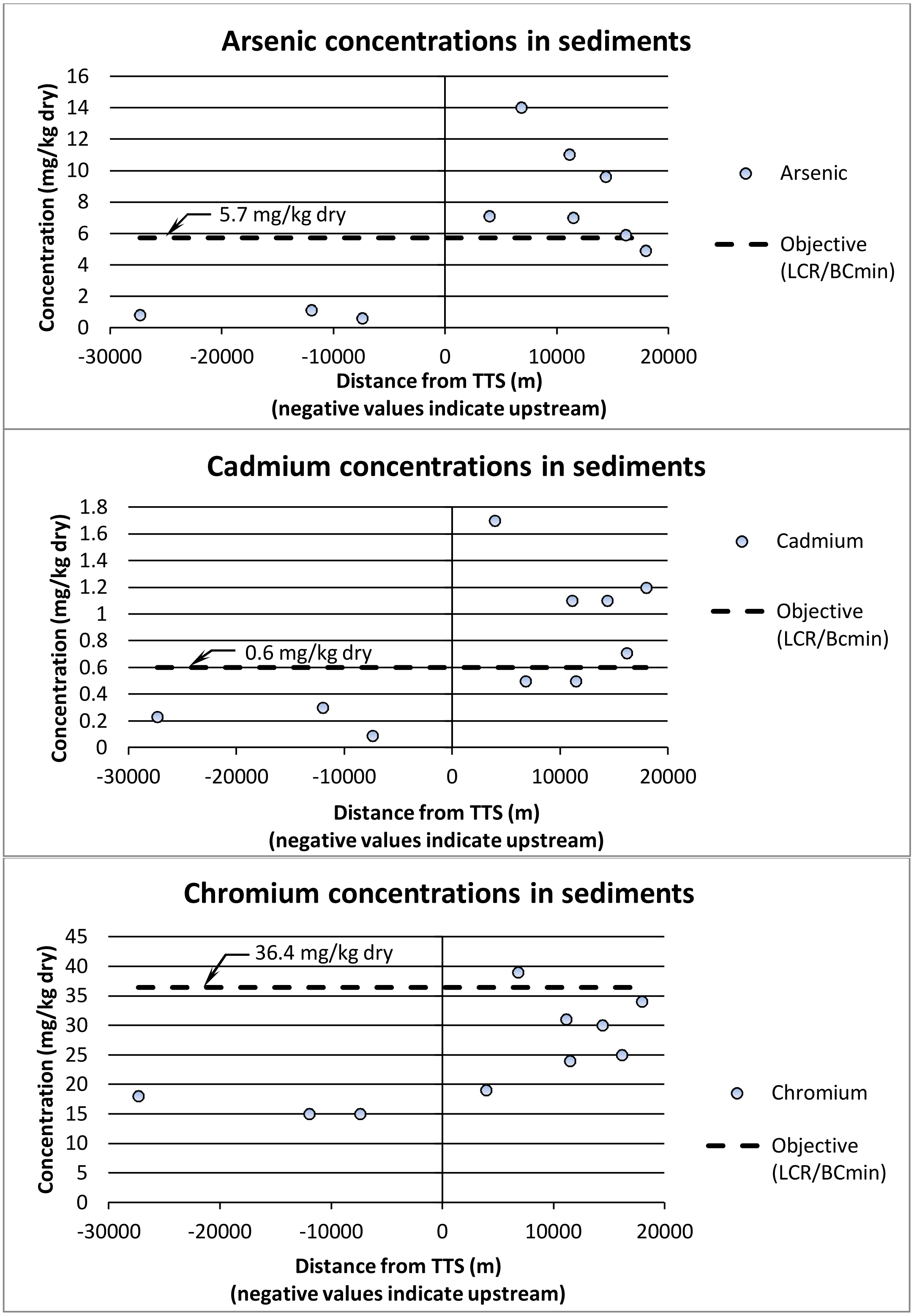


Figure 4-19. Distribution of arsenic, cadmium, and chromium concentrations in depositional sediments with distance from the smelter.

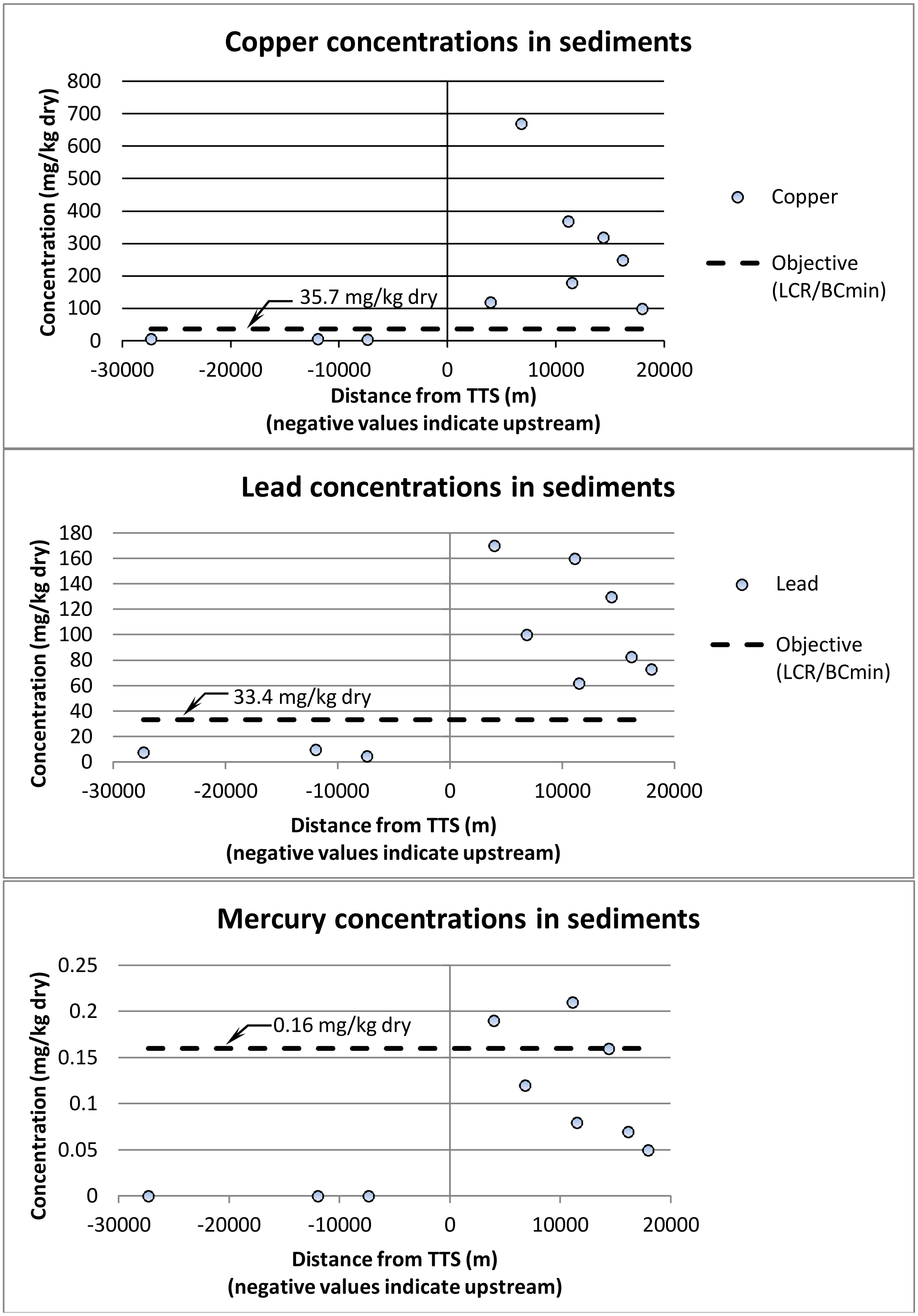


Figure 4-20: Distribution of copper, lead and mercury concentrations in depositional sediments with distance from the smelter.

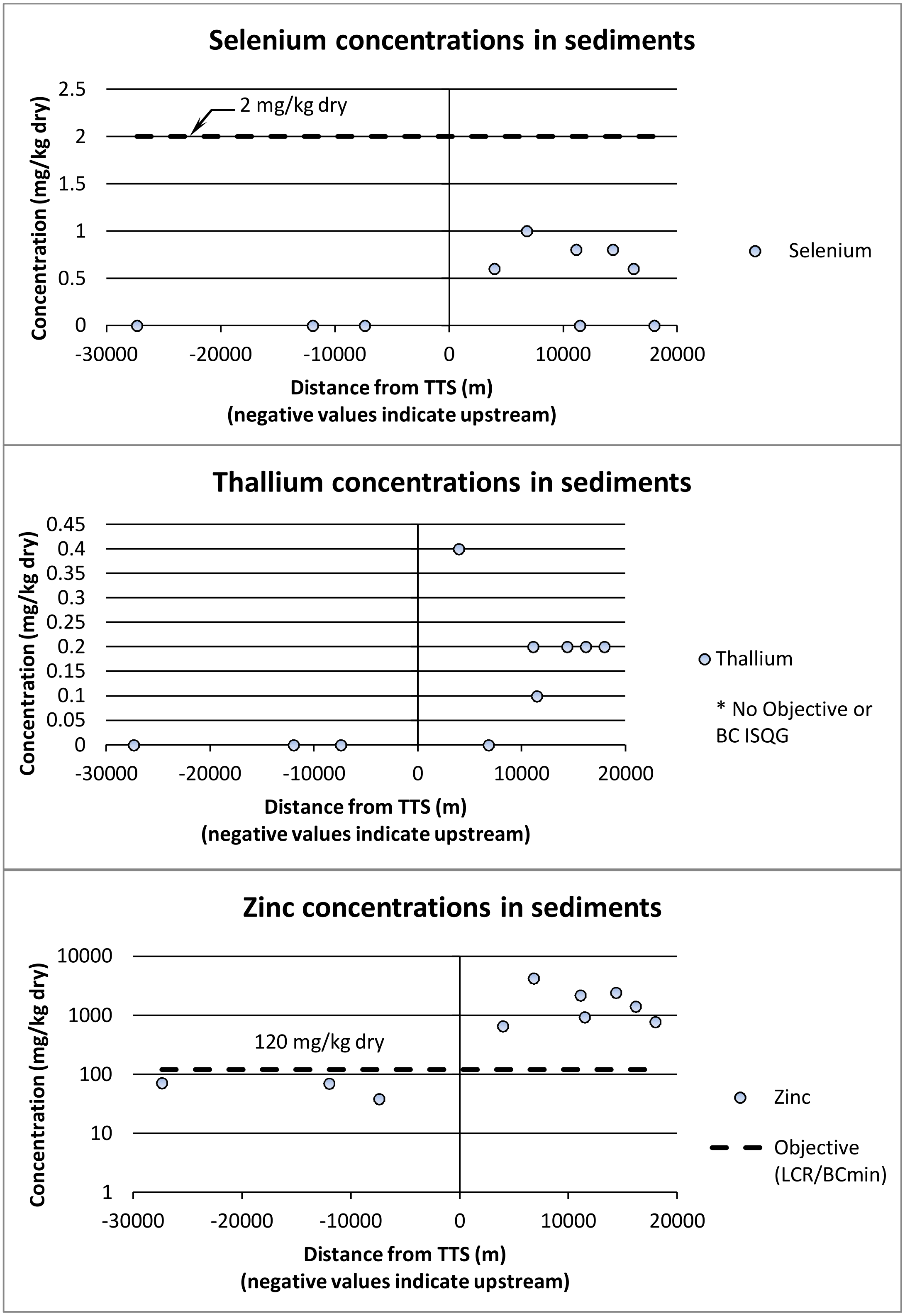


Figure 4-21: Distribution of selenium, thallium and zinc concentrations in depositional sediments with distance from the smelter.

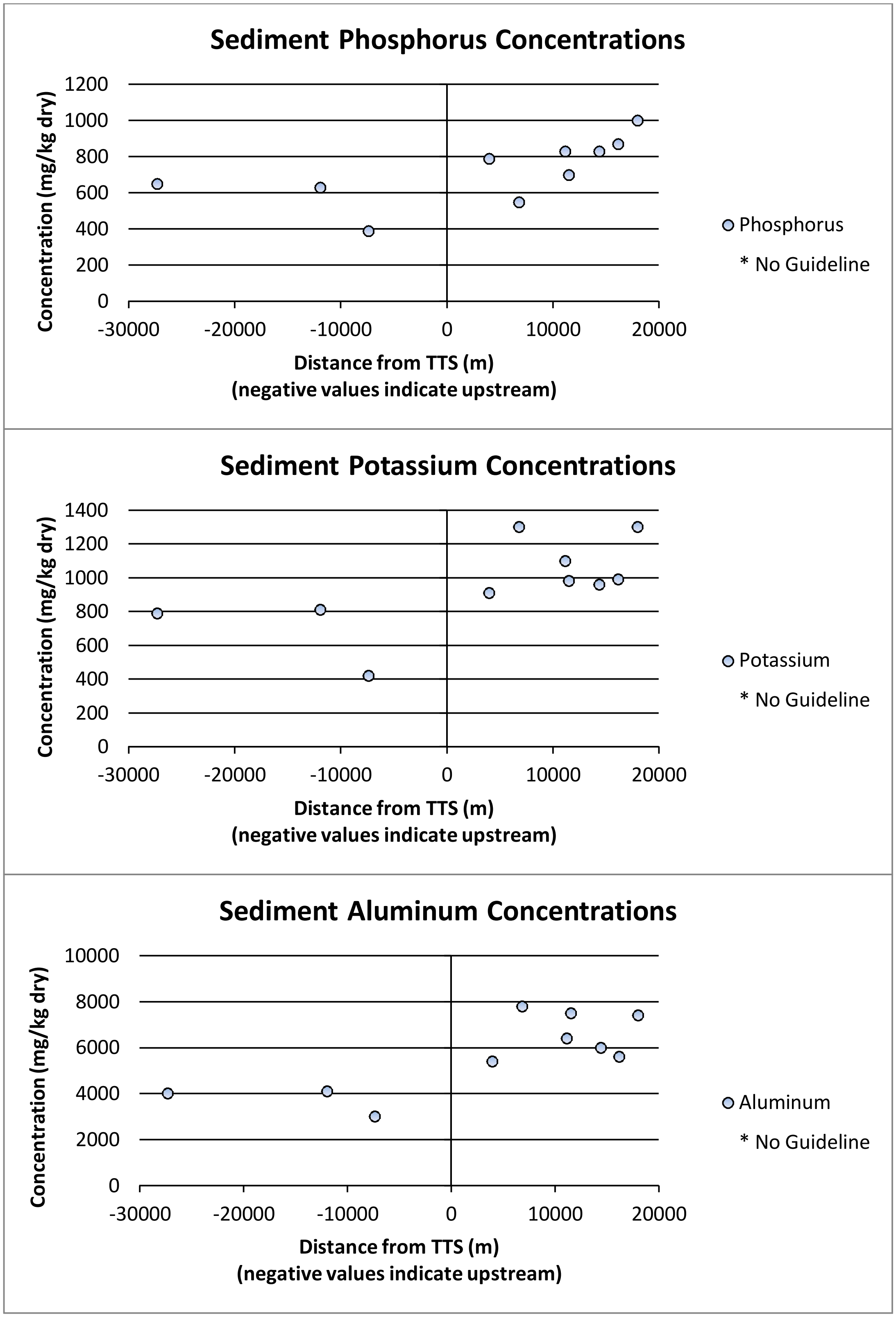


Figure 4-22: Distribution of phosphorus, potassium and aluminum concentrations in depositional sediments with distance from the smelter.

The distance from the smelter was an important factor to sediment metal distribution for: arsenic, cadmium, chromium, copper, lead, selenium, thallium and zinc, but not aluminum or mercury. Of the metals that had elevated sediment concentrations at downstream sites, all but chromium are currently associated with smelter effluents.

The exposed depositional sites demonstrated sediment metal concentrations above reference site concentrations (Figures 4-19 to 4-22 or Figure 4-23). For example, Casino sediments had 9 metals exceeding sediment guidelines but this site may be affected by elevated metals sediments from Casino Creek (Reyes et al, 2004). Maglios sediments had 8 metals exceeding, of which zinc was prominent (Table 4-13). The pattern of sediment exceedances does not match the concentration pattern for Zn Pb and Cu. Other metal inputs may include naturally occurring metal concentrations, historical mining, municipal effluent and stormwater.

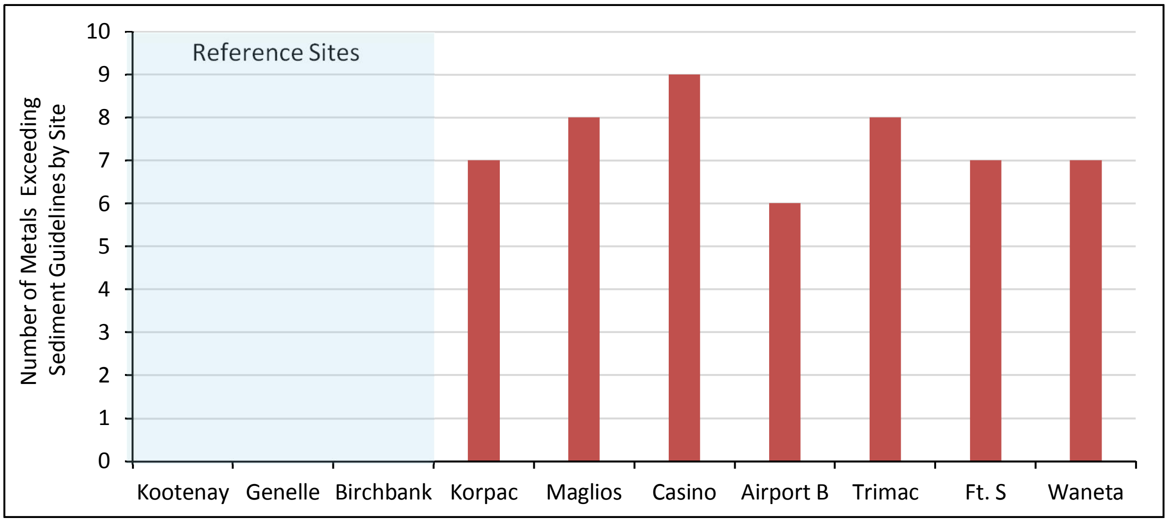


Figure 4-23: Sediment metal concentrations exceedances at depositional sites in the LCR area of interest.

Table 4-13: Exceedances of sediment quality guidelines (based on maximum observed concentrations) in depositional sediment samples from 2003 and 2012 (numbers in grey on 2012 table were not exceedances and are provided for comparison to 2003).

Fall 2003			Reference Sites			Exposure Sites						
Metal µg/g	CCME	BC	Kootenay	Genelle	Birchbank	Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta
Arsenic	5.9	5.7				**10**	**20**	**17**	**8.3**	**7.2**	**20**	**6**
Cadmium	0.6	0.6	0.6			**1.8**	**2.2**	**1.2**	**0.83**	**3.2**	**1.07**	**0.71**
Chromium	37.3	36.4					**56**					**80**
Copper	35.7	35.1				**415**	**1156**	**466**	**338**	**174**	**506**	**1685**
Lead	35	33.4				**173**	**335**	**142**	**122**	**150**	**193**	**126**
Mercury	0.17	0.16						**0.3**	**0.19**	**0.34**	**0.17**	
Nickel	n/a	16								**18**		
Silver	n/a	0.5				**108**	**5.2**	**10**	**1.8**	**1.5**	**3.4**	**1.2**
Zinc	123	120				**2455**	**7746**	**2276**	**1638**	**1067**	**3307**	**17925**

Fall 2012			Reference Sites			Exposure Sites						
Metal µg/g	CCME	BC	Kootenay	Genelle	Birchbank	Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta
Arsenic	5.9	5.7	0.8	1.1	0.6	**7.1**	**14**	**11**	**7**	**9.6**	**5.9**	4.9
Cadmium	0.6	0.6	0.23	0.3	0.09	**1.7**	0.5	**1.1**	0.6	**1.1**	**0.71**	**1.2**
Chromium	37.3	36.4	18	15	15	19	**39**	31	24	30	25	34
Copper	35.7	35.1	5.8	6.3	4	**120**	**670**	**370**	**180**	**320**	**250**	**100**
Lead	35	33.4	7.8	9.9	4.9	**170**	**100**	**160**	**62**	**130**	**83**	**73**
Mercury	0.17	0.16	<0.05	<0.05	<0.05	**0.19**	0.12	**0.21**	0.08	0.16	0.07	0.05
Nickel	n/a	16	9.1	9.7	6.1	10	10	14	12	10	11	**18**
Selenium	n/a	5	<0.5	<0.5	<0.5	0.6	1	0.8	<0.5	0.8	0.6	<0.5
Silver	n/a	0.5	<0.2	<0.2	<0.2	**0.6**	**5.7**	**2.6**	**0.8**	**2.1**	**1.4**	**0.9**
Thallium	n/a	n/a	<0.1	<0.1	<0.1	0.4	<0.1	0.2	0.1	0.2	0.2	0.15
Zinc	123	120	71	70	38	**650**	**4200**	**2200**	**930**	**2400**	**1400**	**780**

Historic sediment data was available for Waneta Eddy, the largest depositional area downstream of the smelter within the LCR (Table 4-14). Guidelines are based on individual samples and therefore maxima are shown here to provide a worst case analysis. In every case, averaged sample values were lower than the guidelines. The four metals of interest showed correlated fluctuations with declining trends after 2003. Concentrations of copper, lead and arsenic at Waneta are now approaching guideline values (Figure 4-24).

Table 4-14: Exceedances of Sediment Quality Guidelines (based on maximum observed concentrations) from 2003 to 2012 at Waneta Eddy (n/a = not available).

Metal µg/g	CCME	BC	2003 spring	2003 fall	2004 fall	2012 fall
Arsenic	5.9	5.7	33.1	n/a	16.9	4.9
Cadmium	0.6	0.6	0.99	0.71	0.73	1.2
Chromium	37.3	36.4	146	79.8	79	34
Copper	35.7	35.1	3428	1685	1620	100
Lead	35	33.4	455	128	281	73
Mercury	0.17	0.16	n/a	n/a	n/a	0.05
Nickel	n/a	16	17.7	n/a	n/a	18
Silver	n/a	0.5	6.8	1.24	3.55	1.1
Thallium	n/a	n/a	0.18	0.11	0.08	0.2
Zinc	123	120	23141	17925	14400	780

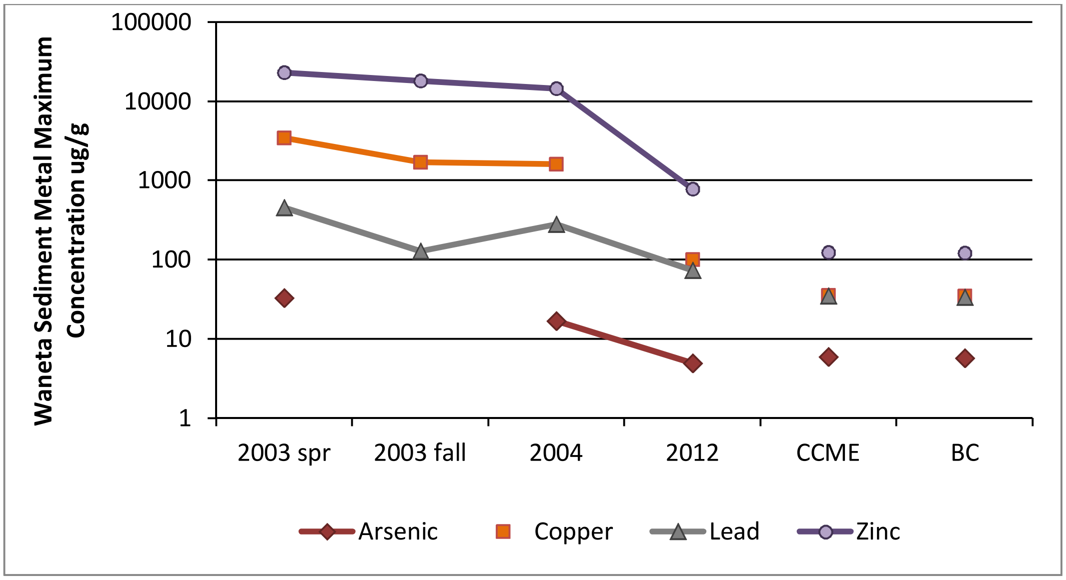


Figure 4-24: Maximum observed concentrations at the Waneta Eddy for metals of interest from 2003 to 2012, compared to guideline values (vertical axis is logarithmic).

The depositional sediment metals that exceeded the possible effects levels (PEL) in 2003 data included Zn, Pb, Cu, As, Hg, and Cd (Table 4-15). In 2012 data, the list of metals exceeding PEL concentrations was limited to Zn, Pb, and

Cu. However, As and Cd did exceed the Lower Columbia Sediment guidelines at many depositional sites downstream of the smelter.

Table 4-15: Depositional Sites with Sediment Metals that Exceed Guidelines.

Metal	2003				2012			
	Exceed ISQG	Exceed PEL	EXP>>REF	BC CSR-sensitive	Exceed ISQG	Exceed PEL	EXP>>REF	BC CSR-sensitive
Arsenic	7 (all sites)	3 (Ma Ca FS)	yes	3 (Ma Ca FS)	6 (not WA)	none	yes	2 (Ma Ca)
Cadmium	7 (all sites)	none	yes	2 (Ma Tr)	5 (not Ma AB)	none	yes	None
Chromium	2 (Ma Wa)	none	-	2 (Ma Wa)	1 (Ma)	none	-	None
Copper	7 (all sites)	6 (not Tr)	yes	7 (all sites)	7 (all sites)	4(Ma Ca Tr FS)	yes	6 (not Wa)
Lead	7 (all sites)	7 (all sites)	yes	7 (all sites)	7 (all sites)	4(Ko Ma Ca Tr)	yes	7 (all sites)
Mercury	4 (Ca AB Tr FS)	none	yes	2 (Ca Tr)	2 (Ko Ca)	none	-	None
Nickel	1 (Trimac)	none	-	-	1 (Wa)	none	no	-
Selenium		-	-	-	none	none	no	-
Silver	-	-	yes	-	-	-	no	-
Thallium	-	-		-	-	-	no	-
Zinc	7 (all sites)	7 (all sites)	yes	7 (all sites)	7 (all sites)	7 (all sites)	yes	7 (all sites)

ISQG = interim sediment quality guidelines
PEL = possible effects level
BC CSR sensitive = BC Contaminated sites regulations Sensitive sediment means sediment at a site with sensitive aquatic habitat and for which sensitive sediment management objectives apply (more stringent objectives)

AB=Airport Bar Ca=Casino FS=Fort Shepard KO=Korpac Ma=Maglios Tr=Trimac Wa=Waneta

Sediment Nutrients

Most sediment nutrients including phosphorus, ammonia and potassium were elevated downstream of Trail, and may contribute to the increased periphyton growth. This is a common occurrence in rivers receiving of urban stormwater.

Summation

Depositional sediment quality in the 2012 samples showed lower concentrations of metals of interest than samples collected in the preceding decade. Sediment metals that exceeded guideline PEL concentrations in 2012 were limited to Zn, Pb, Cu and As.

4.3 Periphyton

4.3.1 Erosional Habitat Periphyton

Primary objectives of the erosional periphyton sampling components are to assess the effects of the effluent discharge on erosional periphyton communities in terms of community structure, composition, and standing crop biomass, and to detect any trends over time.

Erosional cobble substrates account for approximately 1517 ha or 98% of the total area of the LCR between HLK Dam and the Canada - US border. This reflects the erosional nature of the Columbia River in this area and highlights the importance of erosional habitats to the LCR. The years when periphyton studies were conducted in the LCR area of interest are 1995, 2003, 2010 and 2012.

Periphyton biofilms in erosional river habitats are complex, layered assemblages of autotrophs (e.g., algae) and heterotrophs (e.g., bacteria, fungi, yeasts, protozoa), embedded in a protective polymeric matrix (Wetzel 1993, Decho 1990, Drenner *et al.* 1993, Sobczack 1996). This biofilm supplies a large portion of the energy to higher trophic levels in the LCR. Diatoms commonly constitute the dominant group of algae in river biofilms, as they did in every study of the LCR including this one. Internal cycling of materials may predominate in dense erosional biofilms. Under these conditions, biofilm organisms may be protected from external stress conditions such as a temporary shortage of nutrients (Freeman et al. 1995).

Periphytic algae are very sensitive to systemic modifications in water quality and hydrologic regime (Fernandes and Esteves 2003). After a high-flow period such as freshet, bacteria and small closely attached (adnate) diatoms are among the rapid, early colonizers, while slower growing filamentous green algae are among the later arrivals. Diatoms arriving from upstream reservoirs that become entrapped on the biofilm are important to the LCR periphyton (Larratt et al. 2013). The lower extent of seasonal dewatering during low flows is clearly marked by a line where periphyton growth abruptly increases on the permanently wetted substrate (Figure 4-25). Further, spatial diversity on cobble substrates is large with unique communities occupying the cobble crests and other communities develop in the sunlit, interstitial spaces.

Figure 4-25: Comparison of erosional periphyton on periodically exposed substrate (left) and permanently submerged substrate (right).

Microbiological investigation of aquatic habitats indicate that heterotrophic bacteria are the dominant microorganisms present in periphyton biofilms (Leclerc, 2003), followed by algae cells and fungal (mould, yeast) cells. Unfortunately, components of the biofilm other than algae were frequently ignored in earlier LCR periphyton research, but they are vital to biofilm health and can be involved in metal cycling (Besser et al., 1999). The absence of earlier data prevents any trend analysis.

Heterotrophic bacteria platecounts in the area of interest were in the low to typical range compared to samples collected from upper reference reaches of LCR (Larratt et al, 2013), and showed high variability. Heterotrophic bacteria were the most abundant biofilm component. As in upstream reference samples, AOI depositional sites had more moulds and yeasts than erosional sites, a reflection of the greater amount of decomposition that occurs in backwaters (Table 4-16). There were no changes in these biofilm components between reference and exposure sites that exceeded natural variation.

Like depositional sites, periphyton metrics from erosional sites did not show any significant difference between reference and exposure sites (Figures 4-26 and 4-28). This implies that periphyton biomass productivity was relatively constant in the erosional cobble substrates, and that the smelter does not have a measurable effect on periphyton growth. Far field periphyton samples had lower growth metrics than the near field samples.

Table 4-16: Summary of typical range of LCR periphyton metrics from 2012, with comparison to oligotrophic, typical, and productive large rivers and upstream Reach 2 LCR.

Metric	**Oligo-trophic or stressed**	**Typical large rivers**	**Eutrophic or productive**	**LCR-upstream Reach 2 ***	**Exposure Erosional AOI of LCR**
Number of taxa (live & dead)	<20 – 40	25 - 60	Variable	8 – 60	23 – 48
Chlorophyll-a μg/cm^2	<2	2 – 5 (7)	>7 – 10 (30+)	0.04 – 15.3	0.37 – 3.50
Algae density cells/cm^2	<0.2 x10^6	1 - 4 x10^6	>10 x10^6	0.03 – 3.9x10^6	0.05 – 0.73x10^6
Algae biovolume cm^3/m^2	<0.5	0.5 – 5	20 - 80	0.1 – 25	0.15 – 0.93
Diatom density frustules/cm^2	<0.15 x10^6	1 - 2 x10^6	>20 x10^6	0.4 – 2.3 x10^6	0.07 – 0.28 x10^6
Biomass – AFDW mg/cm^2	<0.5	0.5 - 2	>3	0.35 – 7.1	Not sampled
Biomass – dry wt mg/cm^2	<1	1 – 5	>10	3.1	Not sampled
Organic matter (% of dry wt)		4 – 7%		0.74%	Not sampled
Bacteria sed. HTPC CFU/cm^2	<4 -10 x10^6	0.4 – 50 ×10^6	>50×10^6 - >10^{10}	1.5 - >5 x 10^6	0.36 – >2 x 10^6
Bacteria count water CFU/mL	0.1 – 10 x10^4	0.1 – 100 x10^5	2.4 x10^7	Not sampled	Not sampled
Fungal count CFU/cm^2	<50	50 – 200	>200	8 - 1830	<200 - 1000
Accrual chl-a μg/cm^2/d	<0.1	0.1 – 0.6	>0.6	0.02 – 0.22	Not sampled

Comparison data obtained from Flinders and Hart 2009; Biggs1996; Peterson and Porter 2000; Freese et al. 2006; Durr and Thomason 2009; Romani 2009; Biggs and Close 2006. Dodds et al, 1998

*Artificial substrate samples, tends to inflate growth metrics compared to natural substrates

Diatoms were the dominant algae class in 1995, 1999, 2003 and 2012 studies of the AOI, as is typical of large rivers (Table 4-16). In most of this work, the small diatom *Achnanthes minutissima* was dominant at erosional sites, while 2012 results included a variety of dominants, however every 2012 erosional habitat sample had large amounts of *A. minutissima*. Timing of sampling with respect to flow events may account for much of this dominant species variation between years of study.

In 2012, periphyton samples from reference erosional sites had 8 diatom dominants and two dominant filamentous green taxa; while those from exposure erosional sites had 6 diatom dominants, 3 dominant filamentous green taxa, and 1 cyanobacteria dominant. Golder (2003) also found greater cyanobacteria and green algae growth below the smelter. Overall, the density of filamentous green algae was far higher at erosional sites than at depositional sites (Tables 4-17 to 4-19).

There was no significant difference between species richness in erosional areas between reference (34±7 taxa) and exposure sites (38±6 taxa) in the 2012 samples (Table 4-19, Figures 4-26 and 4-28). We measured 23 to 49 taxa per site while earlier studies measured between 63 and 84 taxa per site (Golder 2003, 2007). Improved effluent management throughout the LCR may have lowered phosphorus levels sufficiently to affect species richness. Alternately, the large 2011 and 2012 freshets may have reduced species richness by temporarily eliminating slow-recovering types. Like species richness, when exposure and reference sites were compared for the 2012 data, there was no change in the Simpsons index (Table 4-19). Most of the 2012 chlorophyll-a results were indicative of oligotrophic (nutrient restricted) conditions at <2 μg/cm^2 (Table 4-19), as were most of the 2003 chl-a results (Golder, 2007). The fall 2012 erosional periphyton chlorophyll-a data averaged 0.85 ± 0.4 μg/cm^2 at the two reference sites and increased to 1.31 ± 0.71 μg/cm^2 at the 5 exposure sites (Table 4-19).

In both 2003 and 2012, there were no strong spatial gradients in chl-a with distance upstream or downstream of the smelter. Near-field samples had roughly double the chl-a of the reference sites in 2003 (Golder 2007b) and again in 2012, due to the growth of cyanobacteria whose growth is stimulated in warmer water and by nutrient donations. Seasonal and year-to-year variations were greater than the variation among sites in both the 2003 and 2012 chl-a data sets.

In the 2012 data, periphyton abundance increased from (1.98 ± 0.8)×10^5 cells/cm^2 at reference sites to (2.44 ± 0.8)×10^5 cells/cm^2 at exposure sites. While there was substantial variation among exposure sites, no spatial gradients emerged (Table 4-19). For comparison, abundance ranged from 1.4×10^5 cells/cm^2 to 11×10^5 cells/cm^2 in 2003 and 0.33 to 7.6 × 10^5 cells/cm^2 in 2010 (Golder 2007). All studies found maximum periphyton abundance at downstream sites, within the IDZ.

Temporal trends indicate that periphyton production in the AOI may be dropping to more typical LCR levels (Larratt et al., 2013), but different taxonomic methods and sampling styles employed over the years may also be influencing the data. Conflicting trends in species abundance over the years of study underlines the importance of not over-interpreting periphyton abundance data. Periphyton systems are influenced by a wide number of factors and apparent changes may reflect timing of sampling relative to the time elapsed since the last major flow event or simply large annual variations which have been observed on the LCR (Larratt et al., 2013).

Table 4-16 compares the range of erosional periphyton 2012 data with the range expected for typical large rivers and for upstream LCR Reach 2. Erosional periphyton metrics for the LCR above and below the smelter correspond to the oligotrophic to typical range, further confirming that the influence of the smelter was not detectable.

Growth of periphyton and macrophytes in LCR depositional sites downstream of Trail has decreased dramatically in the past decade (Golder 2007), Nutrient concentrations measured in 2012 and 2013 would classify the LCR as oligotrophic.

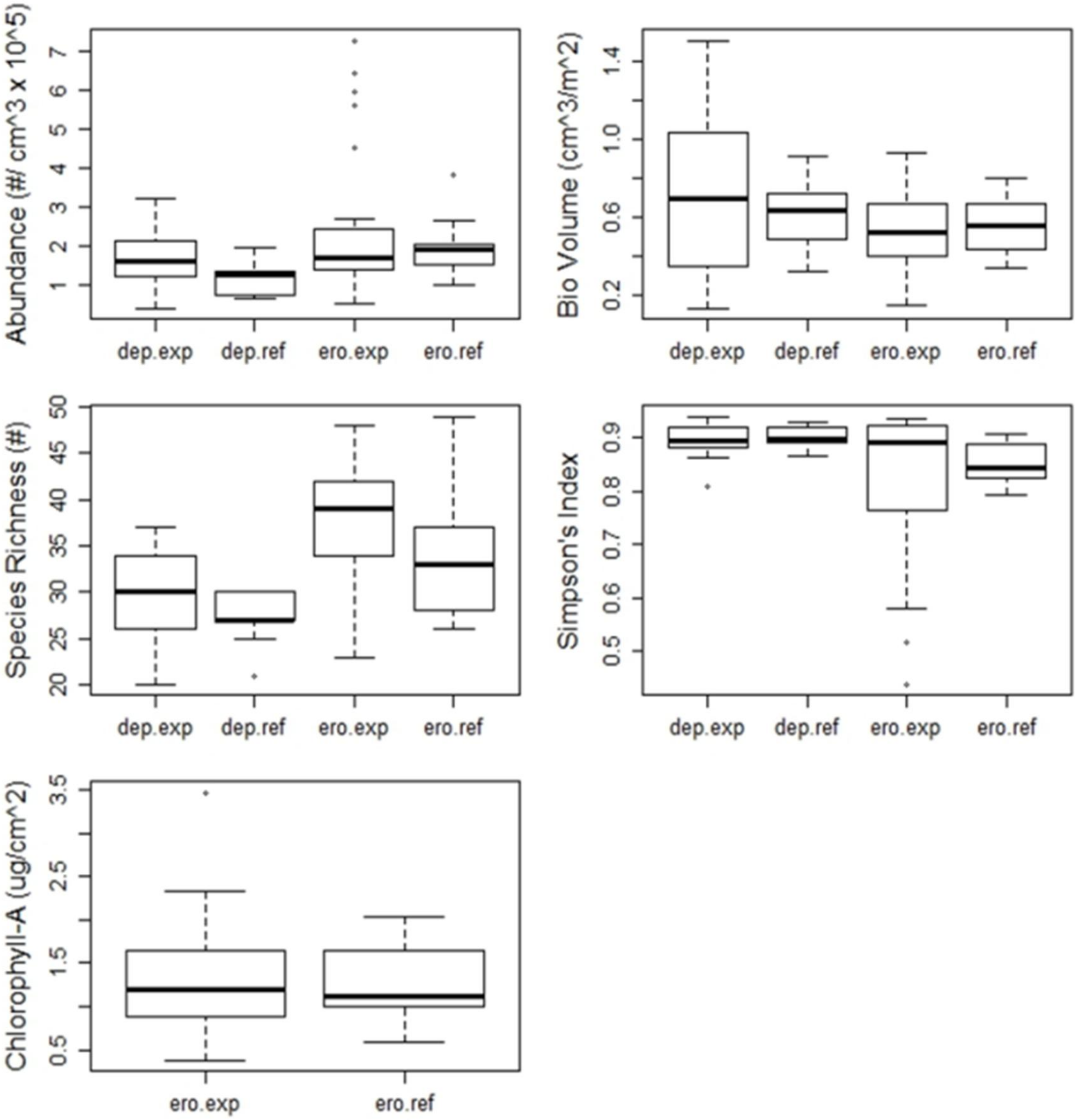


Figure 4-26: Boxplots of five metrics of periphyton community productivity and diversity in depositional and erosional sites above and below TTS outflow (reference versus exposure respectively). Dep = depositional Ero = erosional Exp = exposure Ref = reference.

Periphyton interact with dissolved metals contacting their surfaces (Serra et al. 2009). However, attempts to find periphyton species that are sensitive to metal concentrations in the AOI were largely unsuccessful and contradictory, due to other more important driving forces on periphyton, including overall river flows, localized water velocities, irradiance, nutrient concentrations and grazing pressure. Many of the results are conflicting both in the literature (Medley and Clements 1998, Soldo and Behra 2000) and in other LCR studies over the years (G3 1999, Golder 2003, Golder 2007). Golder (2003, 2007) did not find the same species negatively correlated to metals as G3 (1999), suggesting that factors other than metal concentrations were responsible for the weak correlations observed between periphyton species and metals. In earlier work, only thallium showed a widely occurring negative correlation with 12 diatom taxa out of 20 investigated (Golder, 2007). Correlations do not provide conclusive evidence of adverse effects. Further, we did not find negative correlations between thallium and algae species in the 2012 data. Instead of looking within the diatoms for indicators of metal exposure, it is better to analyze the overall community structure and the distribution of the main algae types in LCR samples.

There was no indication of a spatial trend in the periphyton community structure with distance downstream of the smelter in either the 2003 (Golder) or the 2012 data. Instead of adverse impacts, we found the highest periphyton density, diversity and chl-a occurred at the near-field sites in the 2012 samples. This is in direct opposition to the 2003 findings that appeared to show lower periphyton growth metrics in the near field.

Each site has unique characteristics. Two erosional sites had distinctive periphyton communities. Sample site ERO-EXP 2 was located along the side channel that funnels discharge from CIII and it was noticeably warmer than the main LCR flow. The increased water temperature may have assisted the development of the cyanobacteria *Aphanothece* that inflated the cell count but not the biovolume because of their very small size. As a result of cyanobacteria growth, ERO-EXP-2 species richness was modest and overall chl-a was lower than most sites (Table 4-19). Cyanobacteria including *Aphanothece* are known to have tolerance to sulphide and some metals, however, these bacteria-like cells grow best in warmer water (optimal >10^{o}C) while many diatoms are more efficient competitors at low water temperatures.

Table 4-17: Percent contribution of the major algae groups to periphyton biovolume by site - Depositional Sites, 2012.

Algae Type	Biovolume – Percent									
	Reference Sites			Exposure Sites						
	Kootenay	Genelle	Birchbank	Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta
Diatoms	99.4	95.7	99.4	99.1	99.8	94.8	96.4	99.1	98.1	96.1
Green Algae	0.1	2.2	0.0	0.1	0.0	4.5	2.2	0.0	0.5	0.4
Flagellates	0.4	1.3	0.4	0.5	0.2	0.6	0.9	0.4	1.1	3.2
Blue-green Algae	0.1	0.8	0.2	0.3	0.1	0.1	0.5	0.4	0.4	0.4
Dinoflagellates	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 4-18: Percent contribution of the major algae groups to periphyton biovolume by site – Erosional Sites 2012

Algae Type	Biovolume – Percent						
	Reference Sites		Exposure Sites				
	Ero Ref 1	Ero Ref 2	Ero Exp 1	Ero Exp 2	Ero Exp 3	Ero Exp 4	Ero Exp 5
	Birchbank	u/s Stoney	CIV-Stoney	CIII	CIII-Korpac	Kor-Mag	Mag-Wan
Diatoms	69.2	77.6	42.5	48.5	91.5	59.4	72.6
Green Algae	25.9	18.3	53.6	15.9	6.6	30.7	25.1
Flagellates	4	3.3	3.8	8.7	1.5	5.7	1.9
Blue-green Algae	0.9	0.8	0.2	26.8	0.5	0.4	0.4
Dinoflagellates	0.0	0.0	0.0	0.0	0.0	3.7	0.0

Table 4-19: Periphyton growth metrics by erosional sample site, 2012.

		Near Field			Far Field		Reference	
Erosional		CIV/Stoney	CIII	CII - Kor	Kor - Mag	Mag - Wan	LB opp. CIV	Birchbank
Periphyton	Statistic	Exp-1	Exp-2	Exp-3	Exp-4	Exp-5	Ref-1	Ref-2
Abundance (cells /cm^3 × 10^5)	Mean (± SD)	1.61 ± 0.19	5.97 ± 1.01	1.96 ± 0.61	1.26 ± 0.37	1.4 ± 0.65	1.69 ± 0.35	2.27 ± 1.05
	Median	1.7	5.96	1.74	1.28	1.42	1.53	1.98
	Minimum	1.39	4.56	1.34	0.8	0.54	1.28	1.02
	Maximum	1.82	7.3	2.73	1.73	2.25	2.08	3.84
Species Richness (# taxa)	Mean (± SD)	40.6 ± 3.78	30.4 ± 5.86	42.6 ± 3.21	39 ± 6.28	36.8 ± 4.15	35.4 ± 8.73	32.6 ± 6.47
	Median	40	30	41	39	36	35	31
	Minimum	37	23	40	29	32	26	25
	Maximum	45	39	48	46	42	49	42
Bio Volume (cm^3/m^2)	Mean (± SD)	0.66 ± NA	0.6 ± 0.23	0.58 ± 0.23	0.43 ± 0.17	0.57 ± 0.32	0.52 ± 0.18	0.62 ± 0.15
	Median	0.66	0.52	0.51	0.46	0.57	0.48	0.62
	Minimum	0.66	0.35	0.32	0.15	0.16	0.34	0.44
	Maximum	0.66	0.87	0.93	0.59	0.9	0.77	0.80
Simpson's Index	Mean (± SD)	0.9 ± 0.02	0.54 ± 0.07	0.86 ± 0.09	0.88 ± 0.07	0.88 ± 0.06	0.87 ± 0.04	0.83 ± 0.04
	Median	0.91	0.58	0.92	0.9	0.91	0.89	0.84
	Minimum	0.88	0.44	0.77	0.75	0.79	0.82	0.79
	Maximum	0.92	0.59	0.93	0.93	0.94	0.91	0.88
Chlorophyll-a (ug/cm^2)	Mean (± SD)	1.59 ± 0.63	0.87 ± 0.25	2.05 ± 0.86	0.9 ± 0.46	1.14 ± 0.58	1.1 ± 0.38	1.42 ± 0.52
	Median	1.25	1.01	1.67	0.74	1.03	1.09	1.19
	Minimum	0.95	0.45	1.43	0.37	0.37	0.58	0.93
	Maximum	2.33	1.03	3.47	1.41	1.78	1.64	2.04

Kor = Korpac Mag = Maglios Wan = Waneta

Erosional periphyton community structure at ERO-EXP-1 adjacent to Stoney Creek was considerably different from that typical of the LCR. Filamentous green algae accounted for a larger percentage of the periphyton biovolume. These algae respond to nutrient loading. Samples collected at this site in the 1990's before the fertilizer plant was remediated showed abnormally high filamentous production, and this residual 2012 population may be responding to elevated ammonia in groundwater discharge.

Periphyton growth indicative of mesotrophic conditions is expected to reach 2 – 5 μg/cm^2 chl-a (Table 4-16). Four chlorophyll-a samples reached that range in the near field, but none exceeded 2 μg/L chl-a in the far field (Table 4-19). Groundwater discharges from the smelter site have elevated temperature and elevated nutrients including ammonia and sulphate (Golder 2010). As a result, there is the potential that groundwater may enhance periphyton productivity in the near field, particularly cyanobacteria. Periphyton productivity in this near field area is influenced by greater water velocities and a range of localized stressors such as effluent plumes, Trail Creek discharge, urban runoff, storm water and Ryan Creek (Golder 2007c).

In previous studies, the Old Bridge site was distinctive with more Chrysophytes (golden algae) and higher green algae densities (Golder 2003), which often indicates organic or nutrient enrichment. As of 2012, these algae are no longer prevalent.

Statistical community analyses confirmed that there were no significant differences between erosional sites upstream and downstream of the smelter. These analyses of the natural substrate data were completed at the species level. Potential effects of rare species have not been accounted for in this analysis of the 2012 data and are not expected to be important. Ward/Bray cluster analyses indicated there were 4 or 5 plausible groupings of data (Figure 4-27). NMDS analysis indicates that the most significant factor determining periphyton community is whether the habitat was erosional or depositional (ANOSIM, R: 0.26, p = 0.001). The difference between periphyton communities from reference and exposure sites was not significant (ANOSIM, R: 0.06, p = 0.075).

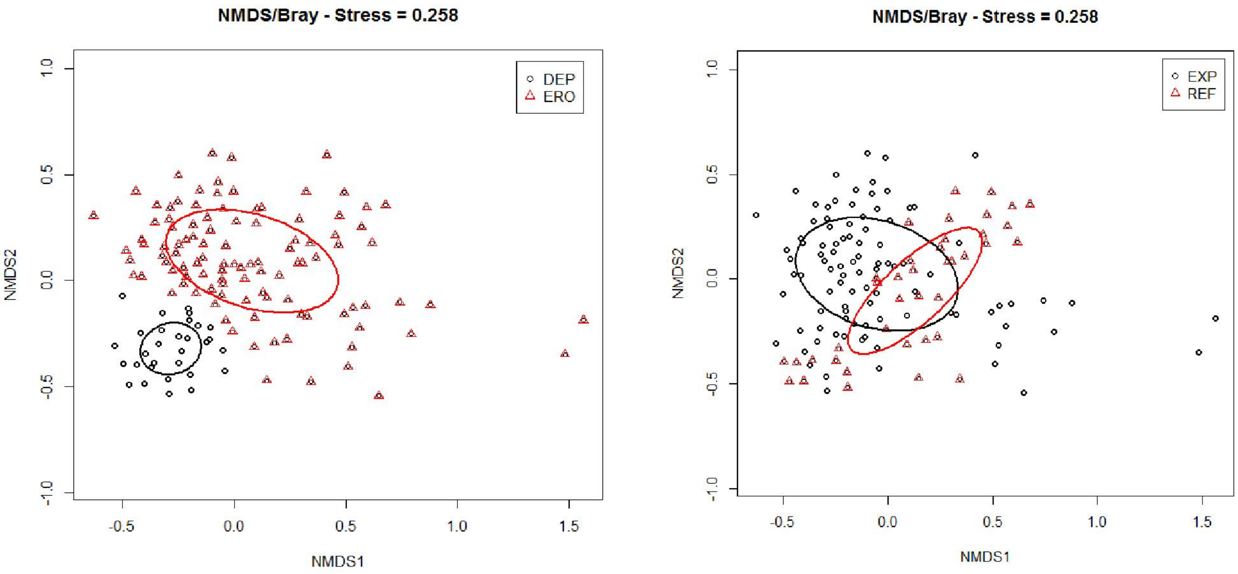


Figure 4-27: NMDS of periphyton abundance at the species grouped by depositional (DEP) sites in black and erosional (ERO) sites in red (left panel) and grouped by exposure (EXP) sites in black and reference (REF) sites in red (right panel).

The results from multi-variate regression mixed models in Figure 4-28 helps explain variation in periphyton communities in erosional habitats. The strong negative relationship between abundance and distance from HLK dam may be indicative of a response to water velocity. ERO-EXP 3, 4 and 5 were glide environments with low water velocities along the bank with upstream eddies. Increasing water velocity in wadeable areas tended to increase growth metrics including abundance, biovolume and chlorophyll-a.

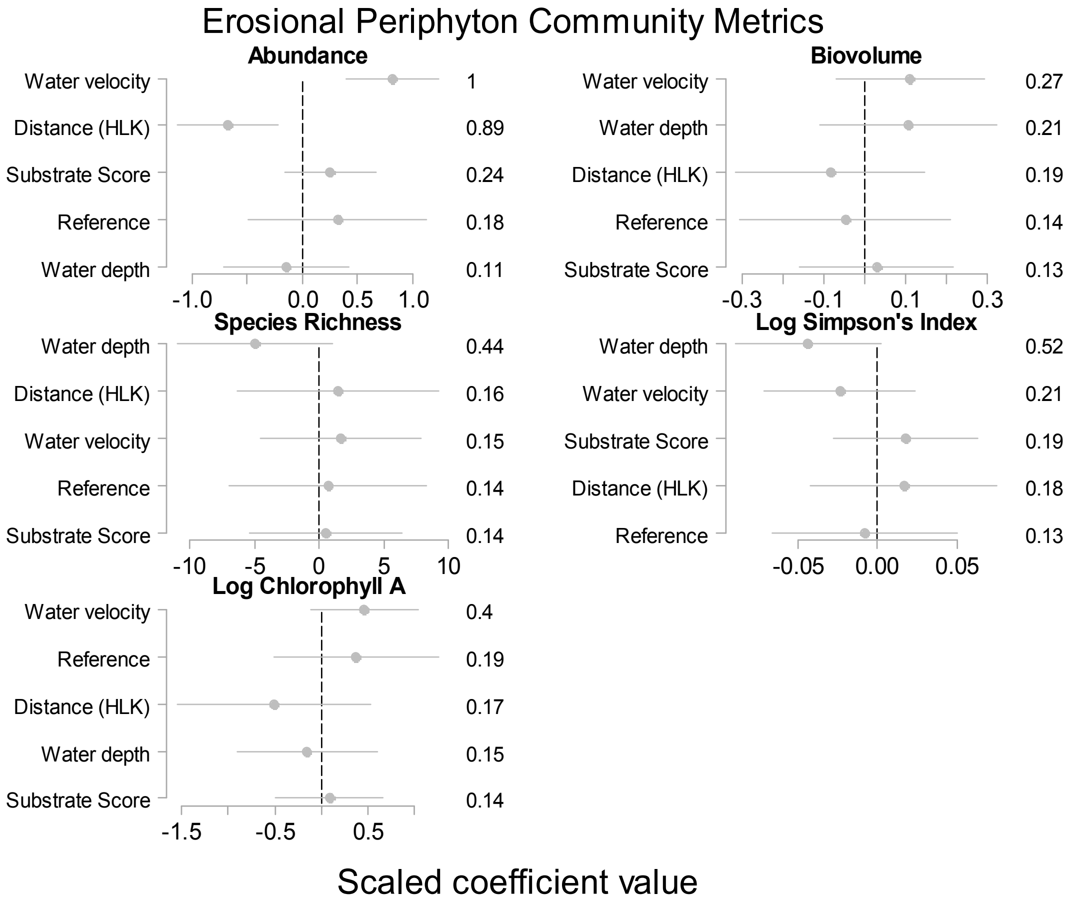


Figure 4-28: Model averaged parameter coefficients and 95% confidence limits from model averaged linear mixed effects models of the effect of treatment (reference or exposure), sediment metal loads, distance downstream of HLK outflow, depth, and substrate on periphyton productivity and diversity in erosional sites in LCR above and below TTS outflow. Coefficients are centered and standardized to allow direct comparisons of the direction and size of effects. Variables with 95% confidence intervals spanning zero are considered of low significance as the direction of their effects are inconsistent among models. Parameter coefficients are sorted by their relative variable importance to the averaged model on a scale of 0 to 1 on the right y-axis of each panel.

Earlier research in the LCR area of interest reported adverse effects of metals on periphyton growth within the near-field prior to 2003 (G3 2001, Suter and Tsao, 1996, Golder 2010). Suter and Tsao (1996) identified chronic effects values were possibly exceeded for Cd Cu Zn, while later reports suggested Pb, Tl and Cu correlated with periphyton growth in the IDZ (Golder 2010). Although some differences in water and sediment metal concentrations were observed between reference and exposure sites in some cases (see section 4.1 and 4.2), the effects of sediment and water metal concentrations on periphyton communities in erosional habitats could not be directly tested because metal concentration data associated with periphyton sampling was not available for these sites. However, it was possible to test the effects indirectly. Periphyton community metrics did not differ significantly between reference and exposure sites according to results from mixed effects models and model averaging Figure 4-28), corroborating results from NMDS (Figure 4-27).

4.3.2 Depositional Habitat Periphyton

Depositional periphyton communities are usually distinct from their erosional counterparts (Table 4-20). In the study area, overall density and species richness in the depositional areas were consistently lower than the overall metrics in the erosional substrates, as they are in most rivers.

Depositional periphyton communities generate about half of the erosional periphyton production per unit area (Barbour, 1999, Wetzel, 2001). The unstable sandy substrate does not allow slow-growing species to develop before substrate disruption via resorting. LCR periphyton densities in the sand ranged from $(0.40 \text{ to } 3.23)\times10^5$ cells/cm^2 and averaged $(1.42 \pm 0.6)\times10^5$ cells/cm^2, compared to $(0.54 \text{ to } 7.03)\times10^5$ cells/cm^2 and an average of $(2.21 \pm 1.35)\times10^5$ cells/cm^2 for cobble substrates (Table 4-20). Biovolume is similar between the two habitat types because the small, closely attached species so prevalent in high flow situations are absent here. Instead, larger diatoms are prevalent, as well as large diatoms that originated in upstream reservoirs. They can settle out with the lower water velocities and accounted for a significant portion of the depositional periphyton.

Depositional periphyton cell density showed no consistent pattern from upstream reference to downstream exposure sites in either the 2003 work (Golder 2007) or in this study. In both studies, the range between sites varied greatly, both within the 3 reference sites and within the 7 exposure sites (Table 4-21). The average cell density of the depositional sites downstream of the smelter exceeded the average of the reference sites (Table 4-22).

Although depositional species were different from those in erosional sites, diatoms still accounted for over 95 – 99.8% of the total periphyton biovolume in depositional surface sediments. Differences in biovolume between exposure and reference sites in depositional habitats were observed, and like abundance, biovolume was greater at sites downstream of the smelter. Such gradual downstream increases in periphyton production is normal in large river systems (Wetzel, 2001).

Species richness and diversity (Simpson's Index) did not differ markedly between exposure and reference sites in depositional habitats although species richness also generally increased downstream of the smelter.

All algae including diatoms have varying sensitivity to dissolved metals and varying requirements for trace metals as nutrients including the metals Mn, Fe, Co, Ni, Cu, Zn, and Cd (Medley and Clemens 1998). There was no indication of a spatial trend in the depositional community structure with distance downstream of the smelter in 2012 periphyton data. This data was collected during low flows when smelter impacts, if any, could be expected to be the greatest.

Only one depositional exposure site stood out as unique and it was the large Waneta site. Among the depositional sites, Waneta had lower than average periphyton abundance, biovolume, species richness, and to a lesser extent, so did the Fort Shepherd depositional site. Waneta also had slightly elevated flagellate densities. The reference site at Genelle also had low abundance and diversity, thus the large depositional eddies may have other influences restricting their periphyton production. If Waneta Eddy data are compared to the reference Genelle Eddy, most growth metrics were greater at Genelle Eddy (e.g., biovolume 0.17 ± 0.04 and 0.46 ± 0.22 cm^3/m^2 respectively) (Table 4-21).

Table 4-20: Periphyton biofilm plate counts for decomposer organisms from erosional and depositional samples, 2012.

	DEP-REF-1	DEP-REF-2	ERO-REF-2	ERO-EXP-1	ERO-EXP-2	ERO-EXP-3	ERO-EXP-5	DEP-EXP-1	DEP-EXP-7	LCR S2	LCR S5	Anaerobic S4/S5
Periphyton Microbes	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	18-Aug-12	18-Aug-12	18-Aug-12
Heterotrophic Plate Count	460000	680000	520000	>2000000	360000	360000	400000	400000	>2000000	>2000000	>2000000	1500000
Mould	200	900	100	<100	<100	<100	200	200	300	19000	100	3400
Yeast	<100	<100	<100	<100	<100	<100	<100	<100	100	3000	<100	900

Units: CFU/cm3
Reportable detection limit: 100

The density of depositional site biofilm components showed wide variation, as is normally the case in the LCR (Table 4-21). There were no important differences between the depositional sites upstream and downstream of the smelter. Like other members of the periphyton biofilm, the decomposer community appears to be responding to physical rather than chemical stressors. Overall, there may have been fewer decomposers present in the downstream compared to the upstream LCR reaches, but the difference in sample season (summer versus fall) may also account for this observation.

Table 4-21: Periphyton growth metrics by depositional sample site.

		Exposure							Reference		
Depositional		Korpac	Maglios	Casino	Airport Bar	Trimac	Ft Shepherd	Waneta	Kootenay	Birchbank	Genelle
Periphyton	Statistic	Dep Exp 1	Dep Exp 2	Dep Exp 3	Dep Exp 4	Dep Exp 5	Dep Exp 6	Dep Exp 7	Dep Ref 1	DEP Ref 2	Dep Ref 3
Abundance (cells /cm^3 × 10^5)	Mean (± SD)	2.72 ± 0.48	2.02 ± 0.49	1.62 ± 0.46	2.26 ± 0.71	1.85± 0.24	0.99 ± 0.35	0.52 ± 0.1	1.37± 0.06	1.14 ± 0.72	0.91 ± 0.33
	Median	2.65	2.05	1.51	2.12	1.88	0.93	0.57	1.37	0.74	0.75
	Minimum	2.28	1.52	1.23	1.63	1.6	0.68	0.4	1.32	0.7	0.68
	Maximum	3.23	2.5	2.13	3.02	2.07	1.37	0.58	1.43	1.97	1.29
Species Richness (# taxa)	Mean (± SD)	37 ± 0	31.3 ± 1.2	30.7 ± 6.0	32 ± 2.7	31 ± 2.65	26.3 ± 2.52	33 ± 2.3	29 ± 1.7	27.3 ± 2.5	25 ± 3.5
	Median	37	32	30	31	30	26	20	30	27	27
	Minimum	37	30	25	30	29	24	20	27	25	21
	Maximum	37	32	37	35	34	29	24	30	30	27
Bio Volume (cm^3/m^2)	Mean (± SD)	1.03 ± 0.42	1.0 ± 0.27	0.93 ± 0.36	0.80 ± 0.21	0.74 ± 0.32	0.28 ± 0.12	0.17 ± 0.04	0.78 ± 0.13	0.55 ± 0.08	0.46 ± 0.22
	Median	0.8	1.11	0.75	0.69	0.64	0.38	0.17	0.77	0.53	0.35
	Minimum	0.78	0.72	0.7	0.38	0.49	0.15	0.13	0.65	0.49	0.32
	Maximum	1.51	1.25	1.34	1.04	1.1	0.35	0.21	0.91	0.64	0.72
Simpson's Index	Mean (± SD)	0.9 ± 0.03	0.92 ± 0	0.93 ± 0.01	0.88 ± 0.01	0.88 ± 0.03	0.87 ± 0.06	0.90 ± 0.01	0.92 ± 0.02	0.88 ± 0.03	0.90 ± 0.01
	Median	0.89	0.92	0.92	0.88	0.88	0.88	0.9	0.92	0.87	0.9
	Minimum	0.88	0.92	0.92	0.88	0.86	0.81	0.89	0.89	0.87	0.89
	Maximum	0.93	0.92	0.94	0.89	0.92	0.93	0.92	0.93	0.92	0.91

Table 4-22: Summary statistics describing periphyton community productivity and diversity in depositional and erosional sites above and below TTS outflow (reference and exposure sites respectively). Values are based on data obtained during Periphyton sampling conducted October 13-16, 2012.

Diversity Measure	Statistic	Depositional Sites		Erosional Sites	
		Reference	Exposure	Reference	Exposure
Abundance (cells/cm^2 × 10^5)	Mean (± SD)	1.14 ± 0.45	1.71 ± 0.8	1.98 ± 0.8	2.44 ± 1.91
	Median	1.29	1.63	1.92	1.72
	Minimum	0.68	0.4	1.02	0.54
	Maximum	1.97	3.23	3.84	7.3
Species Richness (# species)	Mean (± SD)	27.11 ± 2.89	29.95 ± 5.3	34 ± 7.39	37.88 ± 6.13
	Median	27	30	33	39
	Minimum	21	20	26	23
	Maximum	30	37	49	48
Total biovolume (cm^3/m^2)	Mean (± SD)	0.6 ± 0.19	0.71 ± 0.4	0.56 ± 0.17	0.55 ± 0.23
	Median	0.64	0.7	0.56	0.52
	Minimum	0.32	0.13	0.34	0.15
	Maximum	0.91	1.51	0.8	0.93
Chlorophyll-a (μg/cm^2)	Mean (± SD)			1.26 ± 0.46	1.31 ± 0.71
	Median			1.11	1.19
	Minimum			0.58	0.37
	Maximum			2.04	3.47
Simpson's Index	Mean (± SD)	0.9 ± 0.02	0.9 ± 0.03	0.85 ± 0.04	0.81 ± 0.15
	Median	0.9	0.9	0.84	0.89
	Minimum	0.87	0.81	0.79	0.44
	Maximum	0.93	0.94	0.91	0.94

Table 4-23: Dominant periphyton species as defined by percent biovolume for erosional and depositional sites with upstream reference sites shown separately from downstream exposure sites.

Erosional			
Dominant Reference Taxa	Biovolume (%)		Dominant Exposure Taxa
Gomphonema ovilaceum	27.5	11.4	*Tabellaria fenestrata*
Tabellaria fenestrata	18.2	9.5	*Gomphonema ovilaceum*
Stigeoclonium	12.0	9.2	*Aphanothece (saxicola?)*
Fragilaria spp.	7.6	8.2	*Cladophora zonata*
Synedra ulna	2.9	7.4	*Bulbochaete sp.*
Synedra acus	2.3	5.5	*Synedra ulna var radians*
Gomphonema sp.	2.3	4.6	*Synedra ulna var radians*
Navicula spp.	2.2	3.4	*Stigeoclonium sp.*
Bulbochaete sp.	2.1	3.3	*Synedra acus*
Synedra ulna var radians	2.0	2.9	*Navicula spp.*

Depositional			
Dominant Reference Taxa	Biovolume (%)		Dominant Exposure Taxa
Tabellaria fenestrata	31.8	17.8	*Tabellaria fenestrata*
Fragilaria crotonensis	8.1	9.4	*Fragilaria capucina (intermedia)*
Fragilaria capucina (intermedia)	7.3	6.1	*Navicula spp.*
Neidium spp.	5.7	5.8	*Synedra ulna*
Eucocconeis flexella	4.3	4.9	*Eucocconeis flexella*
Navicula spp.	3.9	4.6	*Synedra ulna var radians*
Didymosphenia geminata	3.1	3.9	*Frustulia rhomboides*
Frustulia rhomboides	2.9	3.8	*Synedra acus*
Anomoeoneis sp.	2.6	3.6	*Fragilaria crotonensis*
Gomphonema sp.	2.5	3.5	*Nitzschia sp.*

NOTE: (?) indicates that the identification was tentative

Both erosional reference and exposure site periphyton were dominated by a similar community of diatoms and filamentous green algae (Table 4-24). Species that originated in upstream reservoirs such as *Fragilaria crotonensis* were better represented in reference sites that are physically closer to the reservoirs. Similarly, depositional reference sites had larger biovolumes of *Didymosphenia geminata* (Didymo or rock snot) than the erosional sites because most of the Didymo originates from above the Kootenay confluence (Larratt et al., 2013). In both habitat types, there was no evidence of species shifts reflecting effects from the smelter. Large diatoms such as *Tabellaria fenestrata, Anomoeoneis* and *Neidium* were better represented in the depositional substrates, presumably because they would be swept off erosional substrates in higher flows.

The results from multi-variate linear regression models in Figure 4-29 helps explain variation in metrics of periphyton communities in depositional habitats. In contrast to those developed for erosional sites, these models also included substrate scores and sediment metal groups (PC1 scores) as predictors which both generally explained a considerable amount of the variation in periphyton metrics in depositional sites. The unique character of every depositional area makes the application of linear regression difficult, and the results should therefore be interpreted with caution.

Biovolume, abundance and species richness decreased with distance from the HLK dam and increased with higher substrate scores (larger substrate size).

The two metal groupings characterized by their PC1 scores and included as predictors in depositional models were: Group 1 (Zn Cu As Cr Se) and Group 2 (Pb Cd Tl Hg). These metal groups explained sufficient variation to be included in model averaged results, however, aside from the negative effect of group 2 on species richness, their effects varied widely and were not consistent across models (Figure 4-29).

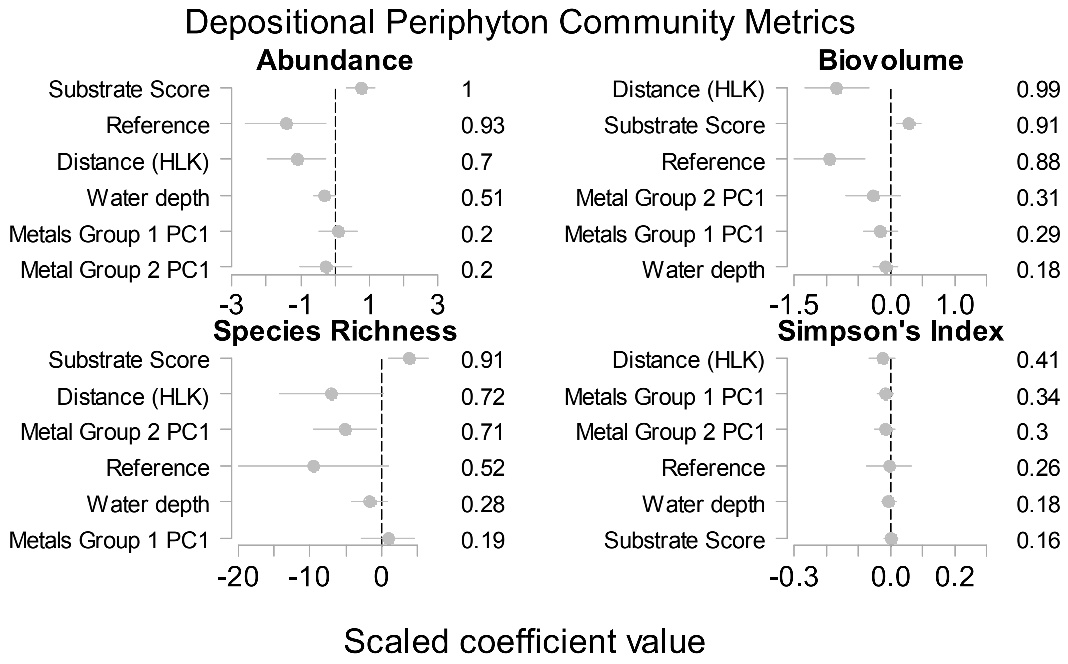


Figure 4-29: Model averaged parameter coefficients and 95% confidence limits from model averaged linear mixed effects models of the effect of treatment (reference or exposure), sediment metal concentrations, distance downstream of HLK outflow, depth, and substrate on periphyton productivity and diversity in depositional sites in LCR above and below TTS outflow. See above figure caption for detailed description.

Overall, periphyton community structure of the depositional sites was similar at all sites, with dominance by diatoms. No effect on periphyton productivity or community structure attributable to the smelter was detected. No spatial trend emerged in depositional periphyton with distance downstream of the smelter in the 2012 data.

4.4 Benthic Invertebrates

In both the reference (upstream of TTS) and exposure (downstream of TTS) sites, benthic invertebrate abundance and diversity can vary by an order of magnitude among sites of the same type. Overall, however species assemblages and distributions observed within this study were comparable to those sampled in other productivity studies being carried out in the LCR further upstream of the AREMP study area (i.e. Castlegar) (Larratt et al. 2013).

The LCR is productive, diverse and variable in terms of benthic invertebrate communities (Larratt et al. 2013). Benthic macroinvertebrates were collected from several historic sites in the Columbia River between 1980 and 1992, with densities varying from 1,518 to 32,712 organisms/m^2, with the number of taxa ranging from 18 to 47 (Hatfield 1994). Based on historical data, benthic invertebrate communities were considered to be healthy and diverse in the Castlegar area of the Columbia River (Hatfield 1997). Within the 2012 AREMP study, macroinvertebrate abundance ranged from about 70,652 organisms/m^2 in depositional sites to about 9,264 organisms/m^2 in erosional habitats. However, comparing abundance values of 2012 with those of previous studies may not be representative since the extreme flow events of summer 2012 were documented to have temporally reduced ecological productivity of the LCR (Larratt et al. 2013).

4.4.1 Invertebrates in Erosional Areas

In erosional habitats, exposure sites had mean invertebrate sample abundance at 6,008 ± 6,554 organisms compared to reference sites with 4,686 ± 5832 organisms (Figure 4-30). Variation in abundance between sites was high.

The greatest sampled abundance was recorded in the near-field exposure area (ERO-EXP-2, site 2) just downstream of TTS Outfall CIII. At this site (total sample area = 2.8 m^2) sampled invertebrate abundance was 25,940 organisms (9,264 organisms/m^2). Of this, EPT accounted for approximately 99.5% of which caddisflies belonging to the family Hydropsychidae (net-spinning caddisfly) accounted for about 90%.

Overall species richness was unchanged between reference and exposure areas with counts of 23.9±9 and 23.3±8 respectively. ERO-EXP-4 had the highest species richness (40) while ERO-EXP-2 had the lowest species richness (20).

Species diversity, expressed by the Simpson's Index was similar between reference and exposure sites. The near-field area (ERO-EXP-2) within the IDZ between outfalls CII and CIII had the highest index (0.449±0.085) followed by the Birchbank reference site (ERO-REF-2) with a mean score of 0.350±0.218.

The mean EPT richness and mean % EPT were both higher in exposure areas. ERO-EXP-4 had the highest EPT richness with 20 species documented while Birchbank had the lowest documented EPT richness with 11 species. Both sample areas within the IDZ (ERO-EXP-2 and ERO-EXP-3) had the highest proportion of EPT within the benthic community with percent EPT values of 0.987±0.006 and 0.915±0.113 respectively.

The mean Hilsenhoff Biotic Index (HBI) of erosional exposure sites was less than erosional reference sites. This indicates a greater predominance of metal-sensitive species (e.g., EPT) downstream of the smelter. The high predominance of web spinning caddis flies are likely responsible for this result. The HBI ranges from 0-10; taxa with a zero value are extremely intolerant of metals, taxa with scores of 2 – 9 have varying degrees of tolerance, while a score of 10 indicates a high ability to withstand metals.

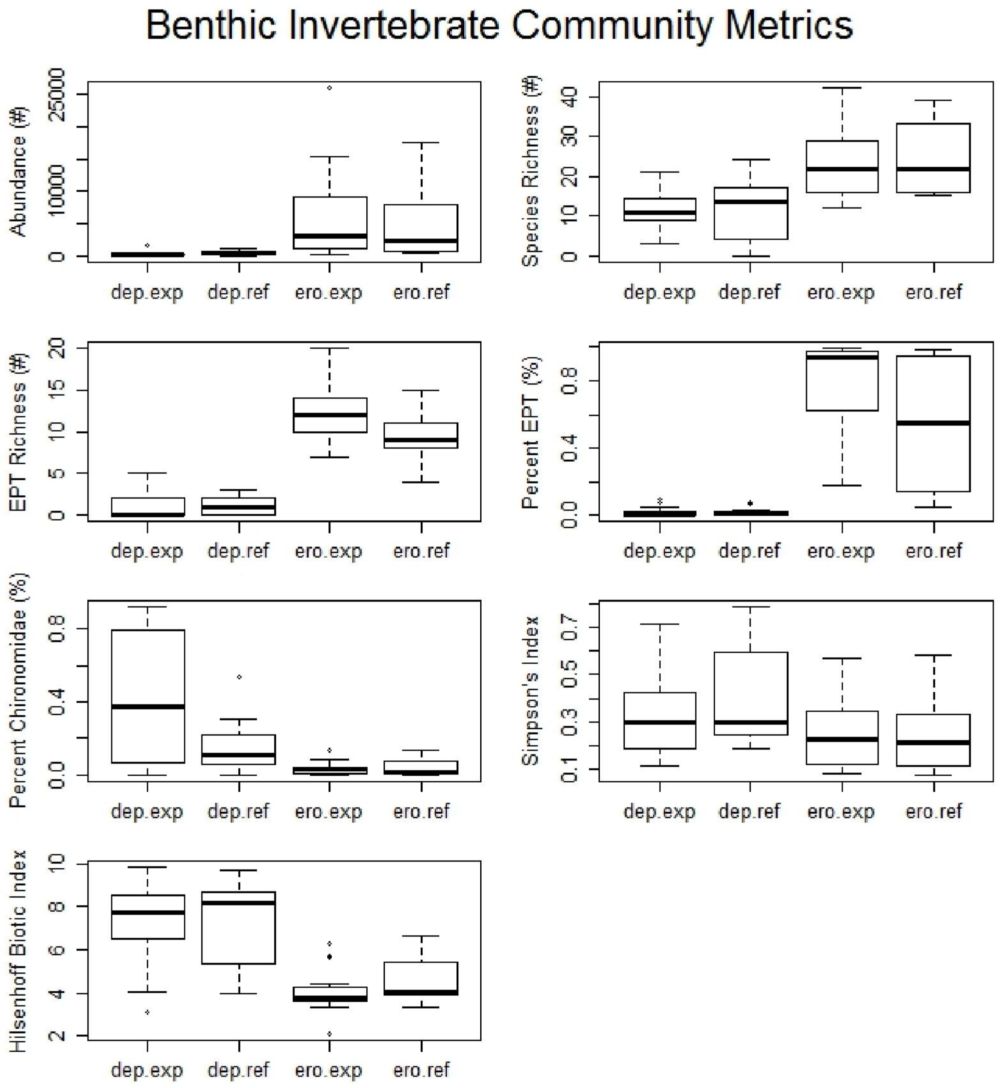


Figure 4-30: Boxplots of seven metrics of benthic invertebrate community productivity and diversity in depositional and erosional sites above and below TTS outflow (reference versus exposure respectively).

4.4.2 Invertebrates in Depositional Areas

In 2012, reference area samples had higher mean invertebrate abundance at 443 ± 373 organisms compared to exposure sites with 187 ± 274 organisms (refer to Figure 4-30). Variation in abundance between sites was high. The greatest individual sample abundance was recorded at Waneta with 1652 organisms (in a single 0.023m^2 dredge), with isopods (*Lircues sp.*) comprising nearly 85% of the sample. Kootenay Eddy and Genelle (reference sites) had the highest mean sample abundance with 623 ± 235 organisms and 623 ± 235 organisms respectively. Overall Waneta had the third highest mean sample abundance at 397±688 organisms. Airport Bar (DEP-EXP-4) had the lowest recorded mean abundance (52±14) organisms/m^2, while Maglios had the lowest individual sample abundance (24 organisms).

Mean species richness was greater in reference areas at 12.2±6.8 taxa, compared to exposure areas (11.6±4.2 taxa). Maximum species richness of 24 taxa was recorded at Kootenay Eddy (DEP-REF-1). Korpac (DEP-EXP-1), situated about 1,490 m downstream of the initial dilution zone had the second highest recorded sample richness with 21 taxa.

Mean species diversity, expressed by the Simpson's Index was modestly greater in reference areas than exposure sites (0.4±0.2 vs. 0.3±0.2).

Relative abundance of *Chironomidae* was higher in exposure areas (0.4±0.4) than reference areas (0.2±0.1). The maximum relative abundance of *Chironomidae* taxa was documented in Casino Creek Eddy (DEP-EXP-3); where 92 % of invertebrates belonged to this family. In spite of having high invertebrate abundance, Fort Shepherd Eddy and Waneta had the lowest mean percent chironomid measures with 3% and 7% relative abundance respectively.

There was no difference in the mean Hilsenhoff Biotic Index scores between reference and exposure areas. This indicates that there is no change in the relative abundance of metals-sensitive species in depositional habitats downstream of the smelter.

4.4.3 Invertebrate community composition

Community analyses of both erosional and depositional habitats was completed at the species level. The potential effects of rare species have not been accounted for in this analysis because only one year of data exists, warranting consideration of the full species dataset to detect differences in community structure between sites. Ward/Bray cluster analyses indicated there were potentially 4 or 5 plausible groupings of data. In line with results for periphyton, NMDS analysis suggested that the most significant factor determining benthic community is whether the habitat was erosional or depositional (ANOSIM, R: 0.75, p = 0.001), while no significant difference in benthic invertebrate communities was observed between reference and exposure sites (ANOSIM, R: 0.06, p = 0.05) (Figure 4-31). Thus, no shifts in community composition between reference and exposure areas were detected by the community analysis.

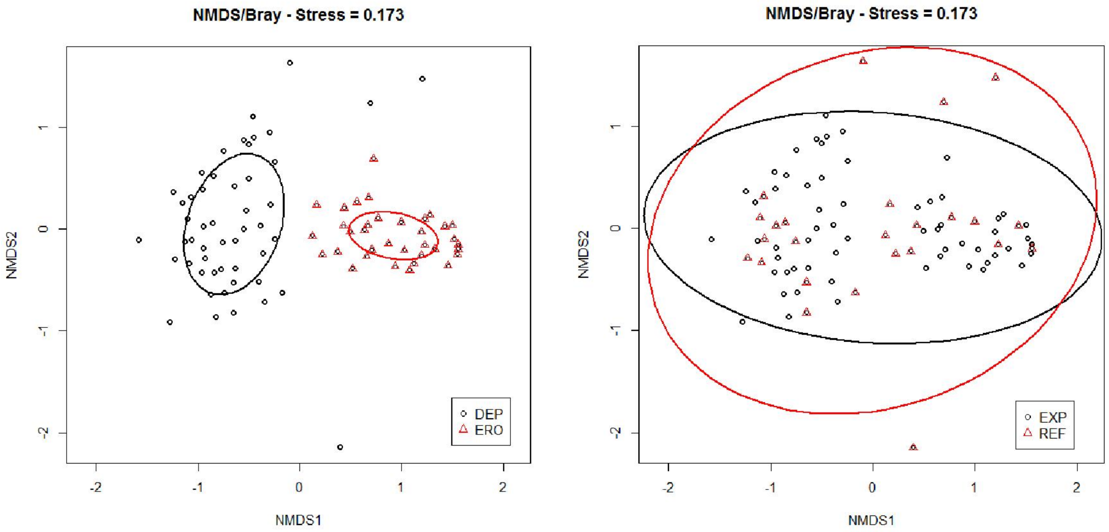


Figure 4-31: NMDS of benthic invertebrate abundance at the species grouped by depositional (DEP) sites in black and erosional (ERO) sites in red in the left panel and grouped by exposure (EXP) sites in black and reference (REF) sites in red.

4.4.4 Benthic Community Response

There are many potential explanatory variables that influence benthic community structure including abundance, species richness, diversity and other metrics summarized above. Flows and the related factors of velocity, shear stress, light penetration and particulate suspension exert control over periphyton and consequently, benthic invertebrate growth. While the AREMP focused on studying the effects of effluent discharge on aquatic environments, Larratt et al. (2013) found that key controlling factors of river production shift with season. During summer high flow periods water temperature and substrate type are the primary controlling factors. During fall lower flow periods, substrate size and wetted depth were dominant factors. Consistent with the AREMP benthic study, Larratt et al. 2013 found that erosional sites with high velocities had greater invertebrate abundance and were predominated by EPT taxa.

For erosional habitats, velocity has a large correlation coefficient and seemed to be the most important covariate influencing invertebrate abundance, EPT richness, percent EPT, and diversity (Figure 4-32). In contrast to abundance, substrate and water velocity had a negative relationship with species richness and Hilsenhoff Index scores. This was evident in ERO-EXP-2, which had the highest recorded sample abundance and the lowest recorded species richness. Within ERO-EXP-2 (along the right bank side channel adjacent to the TTS) substrates were coarse with no fines and the mean velocities were higher than any other sites sampled.

The covariate reference site spanned zero for most explanatory variables. Reference sites are therefore of low importance in describing variation in response variables. This suggests that the position of invertebrate communities in relation to the smelter (effect of reference and exposure sites) may not be the controlling factor in invertebrate species abundance, community richness, or diversity. However, seasonal and annual variation in invertebrate community structure and abundance has not been factored into the mixed effects models.

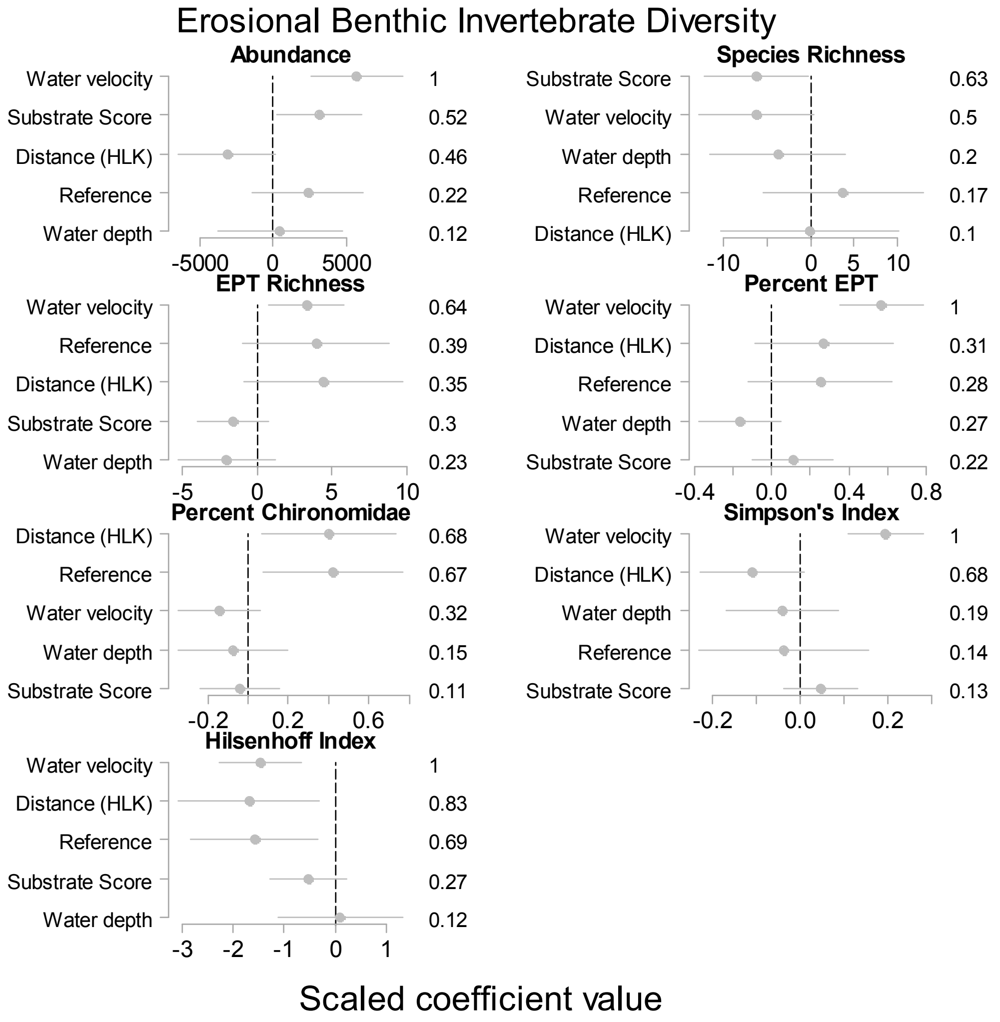


Figure 4-32: Model averaged parameter coefficients and 95% confidence limits from model averaged linear mixed effects models of the effect of treatment (reference or exposure), sediment metal loads, and distance downstream of HLK outflow, depth, and substrate on benthic invertebrate productivity and diversity in erosional sites in LCR above and below TTS outflow.

For depositional habitats substrate score and distance downstream have large correlation coefficients and together seem to be the most important covariates influencing invertebrate abundance (Figure 4-33). The negative effects of these covariates indicates that as substrate particle size (in depositional habitats) as well as distance downstream (from HLK) increases, abundance, species and EPT richness, and % *Chironomidae* all decrease. In addition, metals group 1 (arsenic, chromium, copper, selenium, and zinc) had a moderate negative correlation effect on species richness. This metals group was primarily driven by zinc and copper (loadings of 0.99 and 0.15 respectively). In contrast, metals group 2 was positively correlated with both EPT richness and species diversity.

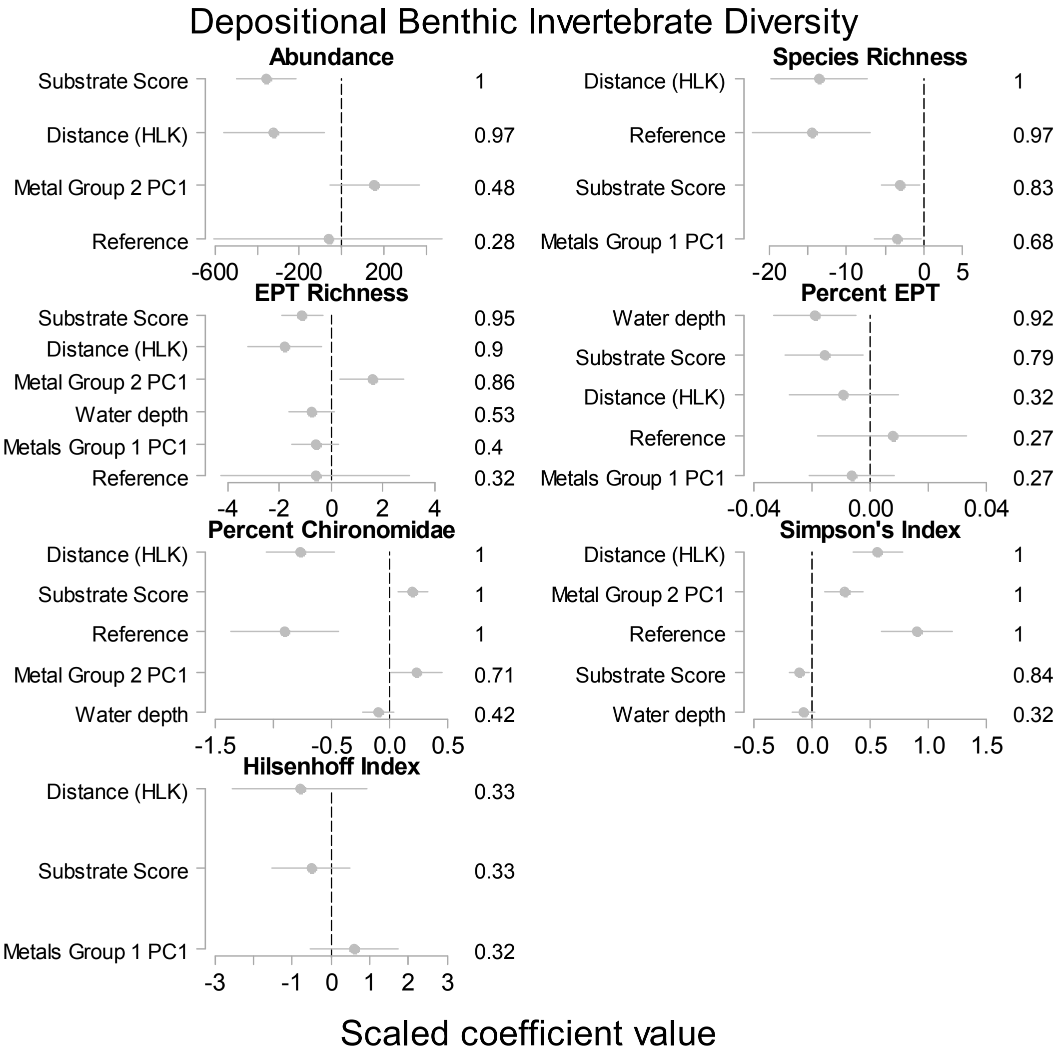


Figure 4-33: Model averaged parameter coefficients and 95% confidence limits from model averaged linear mixed effects models of the effect of treatment (reference or exposure), sediment metal loads, distance downstream of HLK outflow, depth, and substrate on benthic invertebrate productivity and diversity in depositional sites in LCR above and below TTS outflow.

4.5 Large Bodied Fish Condition and Tissue Metals

A total of 120 adult fish (Mountain Whitefish, Rainbow Trout, and Walleye) were collected from two sites in the study area. Sixty fish (20 of each species) were collected from the reference area (HLK Dam downstream to Robson Bridge) and 60 fish were collected from the exposure area (Beaver Creek downstream to Waneta). Sampling was biased toward obtaining catchable-size fish (>200 mm) that would be typically sought by anglers. Thus, lower age class fish were generally excluded from sampling. Varying tissue metal concentrations among the three species was expected due to the different life histories and feeding habits. Walleye, being a top-level predator (generally piscivorous) was expected to have higher concentrations of bioaccumulative substances. Summaries of ANCOVA models testing for effects of treatment, species, sex, and individual size on condition and tissue metal concentrations are included in Appendix H.

4.5.1 Large Bodied Fish Condition

There was no significant difference in Mountain Whitefish and Rainbow Trout condition (k) between fish caught in the reference area upstream of the TTS and those caught downstream of the TTS (Figure 4-34, $R^2 = 0.07\text{-}0.14$, $p > 0.05$). Walleye condition was somewhat higher in fish caught from the reference area than those caught downstream of the TTS. This increased condition may simply be a result of improved forage conditions (i.e., higher prey fish populations) in the upstream reaches of the LCR near Castlegar.

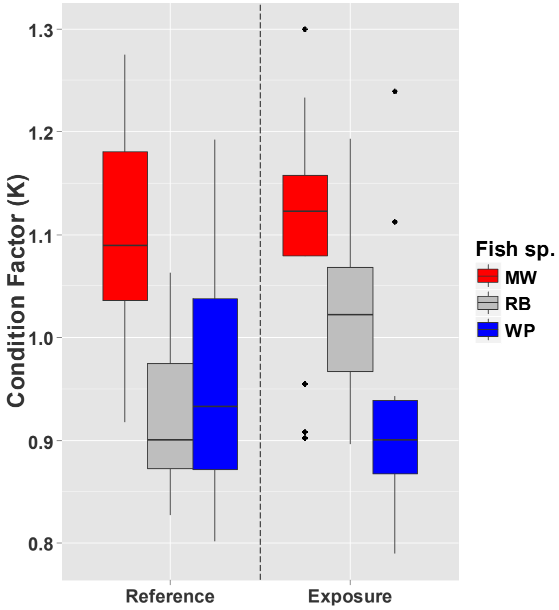


Figure 4-34: Box plots of Mountain Whitefish, Rainbow Trout, and Walleye condition (k) sampled from reference (upstream of TTS) and exposure (downstream of TTS) areas in the LCR.

4.5.2 Large Fish Tissue Metals

Metals that may have the ability to accumulate in fish include: arsenic, cadmium, chromium, lead, and mercury. Concentrations measured from fish caught in 2012 were compared to Canadian guidelines for chemical contaminants and toxins in fish for Human consumption (Canadian Food Inspection Agency 2011) and the LCR tissue residue objectives (TRO) for wildlife (1997). The 2012 data was also compared to historic data.

When considering tissue metals concentrations, it should be acknowledged that individuals of these species can migrate long distances at different times of the year. The distance an individual may travel and the residency time in a given area is not known. In other words, fish collected from the upstream reference area may have frequented areas downstream of the smelter and vice versa.

Tissue metals concentrations are reported in mg/kg wet. The mean % moisture of sampled fillets, whole fish, and gut samples was 73.8% ±3.8, 71.0% ±3.7, and 65.5% ±9.5 respecticely.

4.5.2.1 Arsenic (As)

Arsenic concentrations in fillet tissues are unlikely to pose a risk to human health or wildlife consumers of fish. None of the muscle tissue and whole fish had arsenic concentrations above the TRO (wildlife) guideline (0.47 mg/kg wet weight) (Figure 4-35).

Fillet arsenic increased marginally with fork length, but did not significantly differ among reference and exposure sites, or among species or sex. (Model $R^2 = 0.16$, $p > 0.05$). Whole body samples did not differ significantly in arsenic concentrations between reference and exposure sites, among species, sex, or lengths. Arsenic levels were statistically higher in stomach contents of smaller Rainbow Trout and Walleye caught from the reference area upstream of the TTS (model $R^2 = 0.36$, $p < 0.05$).

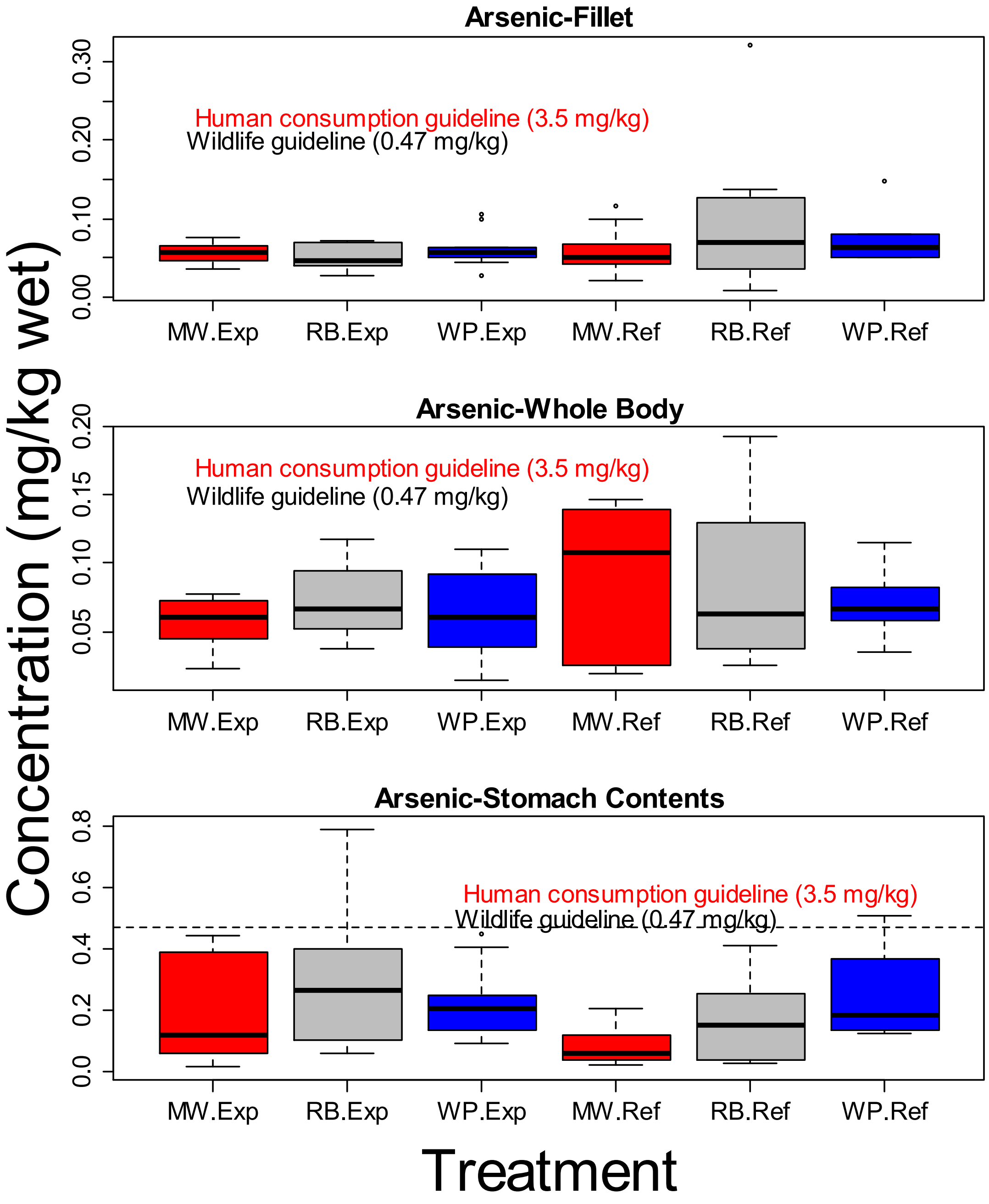


Figure 4-35: Concentrations of Arsenic (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively. Human consumption and wildlife guidelines are included as horizontal lines where they fall within metal concentrations.

4.5.2.2 Cadmium (Cd)

It is unlikely that cadmium concentrations in muscle tissue and whole fish pose health risk concerns to humans or wildlife. Muscle tissue and whole fish Cd concentrations were well below the TRO (0.9 mg/kg wet) Figure 4-36).

Fillet cadmium was significantly lower in reference sites compared to exposure sites, and in Rainbow Trout and Walleye (model $R^2 = 0.54$, $p < 0.05$). Cadmium concentrations were significantly higher in whole body samples from exposure sites and in Mountain Whitefish relative to other species (model $R^2 = 0.46$, $p < 0.05$). Cadmium levels were significantly higher in the stomachs of Walleye sampled from the exposure area downstream of the TTS (model $R^2 = 0.42$, $p < 0.05$) compared to those sampled from the reference area upstream.

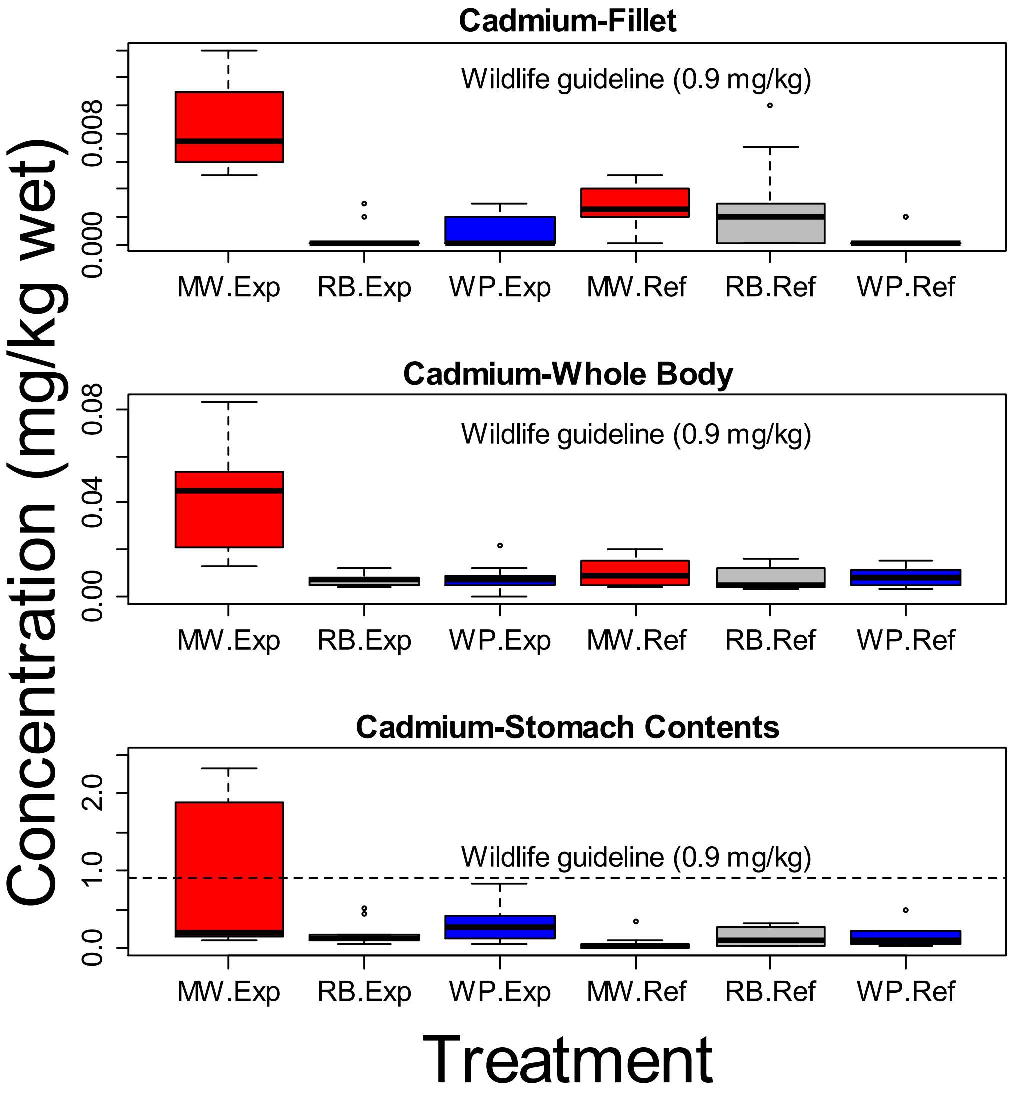


Figure 4-36: Concentrations of Cadmium (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively. Human consumption and wildlife guidelines are included as horizontal lines where they fall within metal concentrations.

4.5.2.3 Chromium (Cr)

It is unlikely that concentrations of chromium pose health risk concerns to humans or wildlife consumers of fish. Mean Cr concentrations in muscle tissue (fillets) and whole fish were below detection (<0.01 mg/kg). The maximum recorded Cr concentration from muscle was from a reference area Mountain Whitefish caught near Robson. Maximum muscle and whole fish Cr concentrations were 0.07 and 0.04 mg/kg wet weight respectively, which is well below the 0.94 mg/kg wet weight TRO.

Relatively elevated gut Cr concentrations were observed in 3 Mountain Whitefish from the reference area and 1 Whitefish and 1 Rainbow Trout from the exposure area (Waneta). The mean gut chromium concentration was below TRO for all species. Unlike previous years, Mountain Whitefish had the highest Cr concentrations in muscle tissue and gut followed by Rainbow Trout (Figure 4-37).

Fillet chromium did not differ significantly between reference and exposure areas for species, gender/sex or fork length of large-bodied fish. Neither treatment (i.e., whether fish were caught from the reference or exposure area), species, sex, nor length significantly influenced chromium concentrations in whole body samples (model $R^2 = 0.08$, $p > 0.05$). Chromium levels measured in fish guts were significantly higher in exposure area fish and in Mountain Whitefish (model $R^2 = 0.49$, $p < 0.05$) relative to reference area fish and other species.

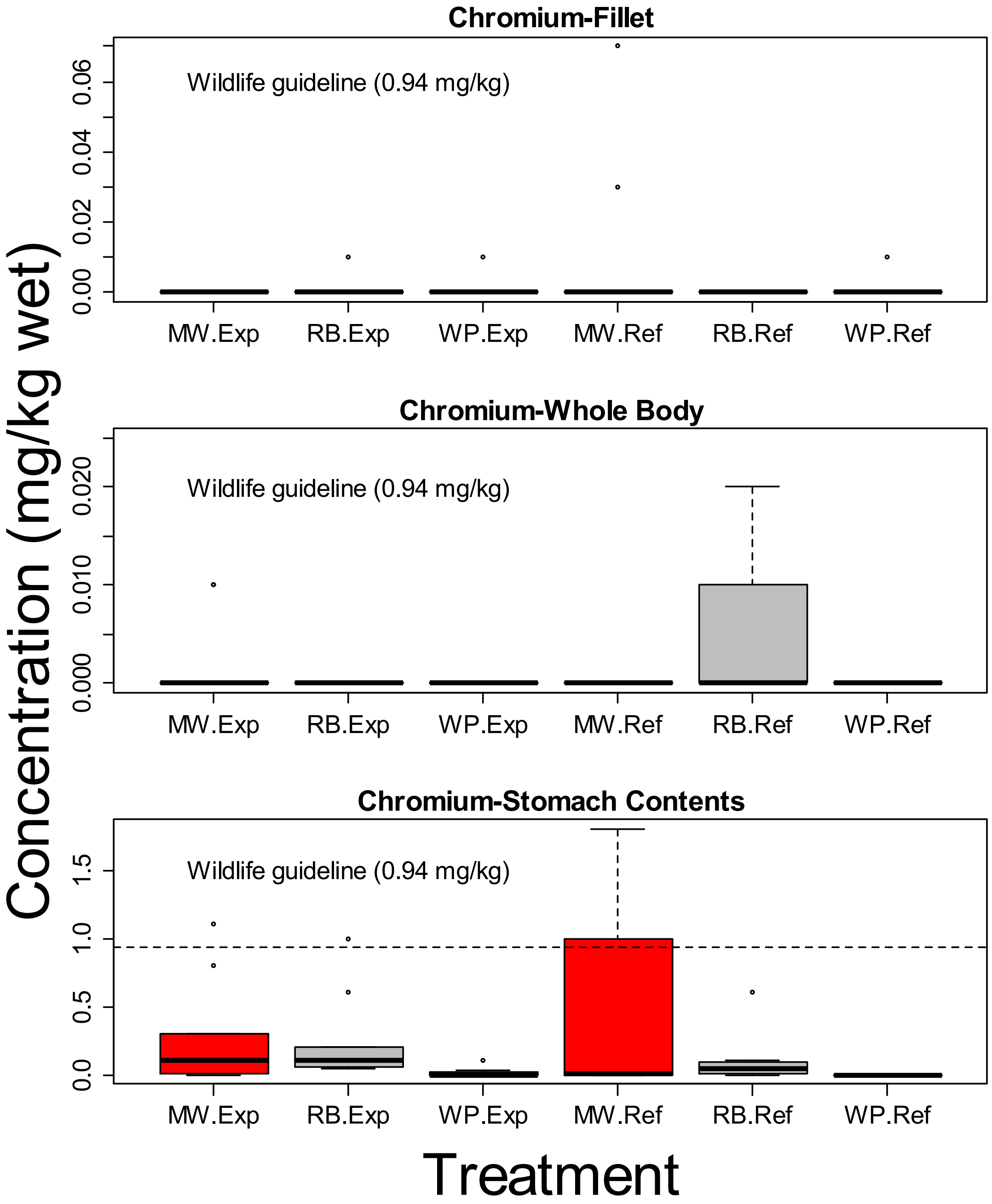


Figure 4-37: Concentrations of Chromium (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively. Human consumption and wildlife guidelines are included as horizontal lines where they fall within metal concentrations.

4.5.2.4 Copper (Cu)

There is no tissue guideline available for copper. Fillet copper was significantly lower in Rainbow Trout and Walleye but was not significantly different between reference and exposure areas (model $R^2 = 0.69$, $p < 0.05$) (Figure 4-38). Copper concentrations were significantly lower in Walleye and decreased with fork length, although differences were small (model $R^2 = 0.57$, $p < 0.05$). Copper levels were significantly higher in guts of fish in exposure sites and in Rainbow Trout, and decreases marginally with fork length (model $R^2 = 0.71$, $p < 0.05$).

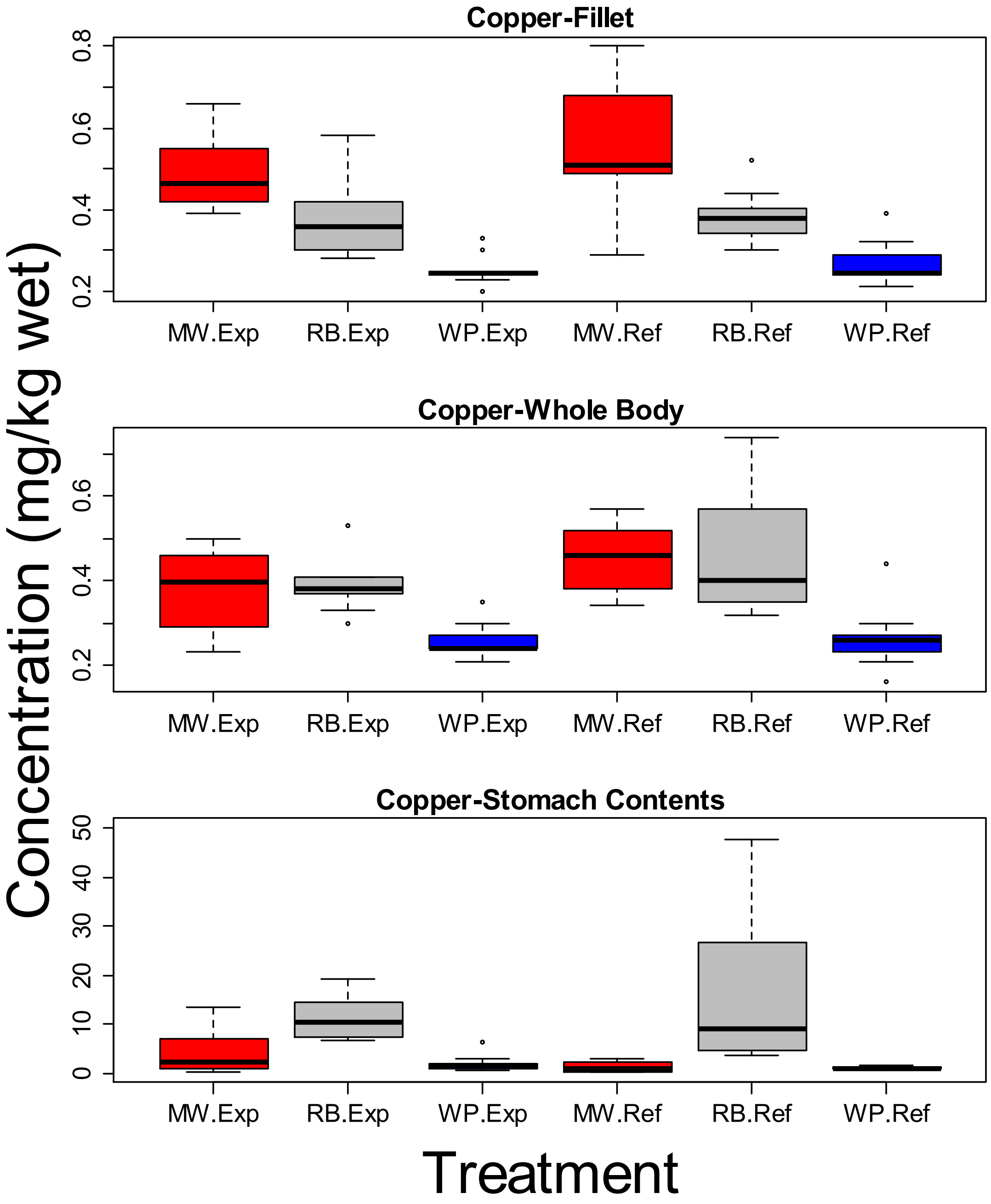


Figure 4-38: Concentrations of Copper (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively.

4.5.2.5 Lead (Pb)

Mean lead concentrations in muscle tissue and whole fish samples were below the Canadian guideline human consumption (0.5 mg/kg wet) and LCR TRO for wildlife in 2012 (0.16 mg/kg wet) (Figure 4-39).

A single Mountain Whitefish had a measured exceedance of the TRO in muscle at Waneta (0.216 mg/kg wet). Four (4) Mountain Whitefish and 1 Rainbow Trout from the exposure area had whole body concentrations in excess of the Pb TRO.

Mountain Whitefish had highest mean gut concentration of 2.4 mg/kg wet followed by Rainbow Trout (1.5 mg/kg wet). Walleye had mean gut concentration of 0.2 mg/kg wet. One Whitefish had a gut lead concentration of 12 mg/kg wet.

Fillet lead was significantly higher in fish sampled from the exposure area, in males, and Mountain Whitefish, and increased with fork length (model $R^2 = 0.53$, $p < 0.05$). Lead concentrations in whole body samples were significantly lower in reference area, Walleye and female fish (model $R^2 = 0.44$, $p < 0.05$). Stomach lead concentrations were significantly higher in fish sampled from the exposure area and in Rainbow Trout and decreased slightly with fork length (model $R^2 = 0.68$, $p < 0.05$).

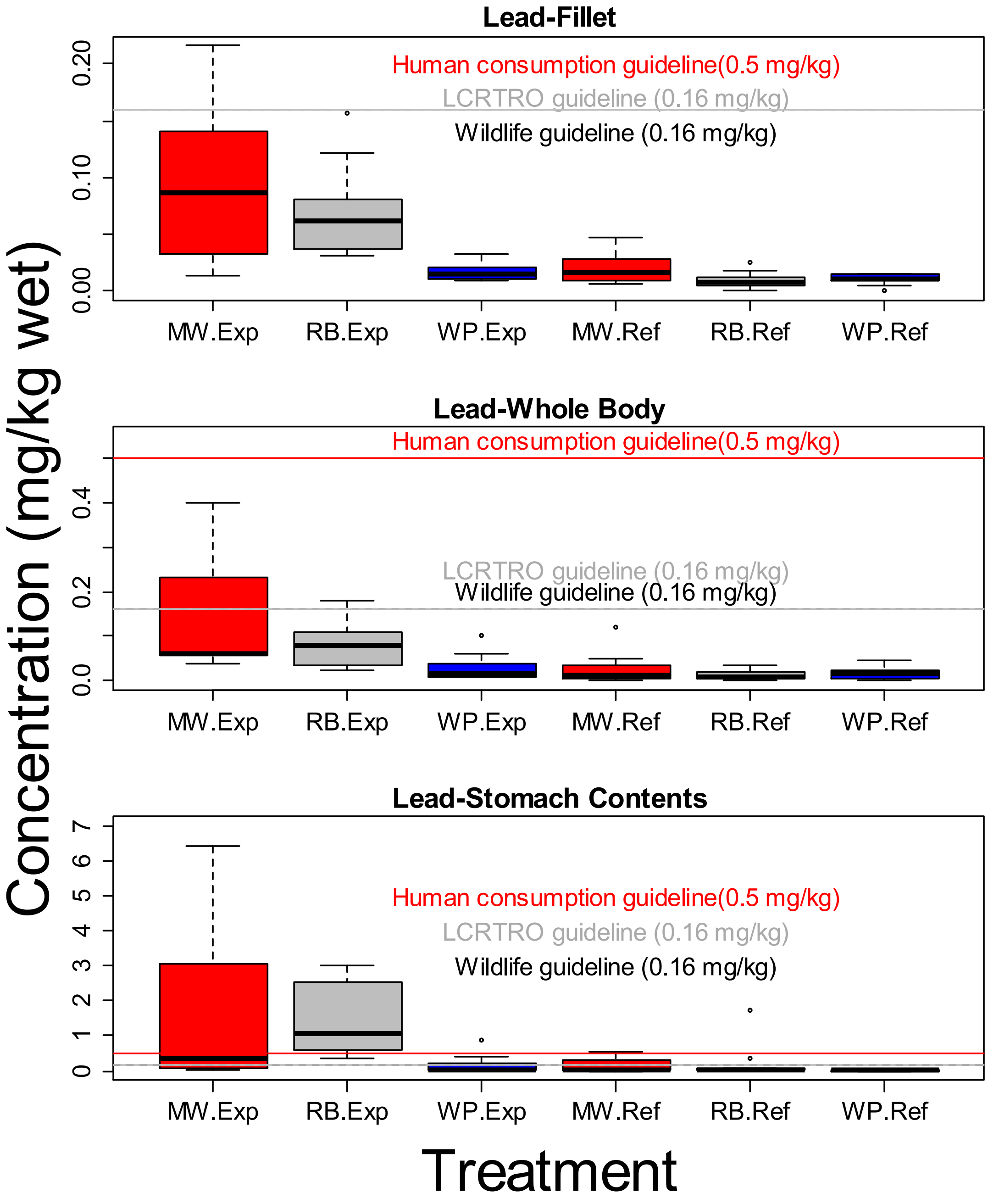


Figure 4-39: Concentrations of lead (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively. Human consumption and wildlife guidelines are included as horizontal lines where they fall within metal concentrations.

4.5.2.6 Mercury (Hg)

Mean muscle (fillet), whole fish, and gut concentrations were below the Canadian guidelines for human health (0.5 mg/kg wet). The Lower Columbia TRO (0.10 mg/kg wet) was exceeded by fillet and whole fish concentrations in Walleye from both reference and exposure areas and by Rainbow Trout fillets from reference area fish. Mean Hg tissue concentrations were greater in Walleye and Rainbow Trout sampled from the reference area upstream of the TTS (Figure 4-40). In contrast with other parameters, Hg concentrations were highest in Walleye (both muscle and whole fish samples).

Previous studies showed Walleye to have had the highest mean mercury concentrations of between 0.08 – 0.65 mg/kg wet followed by Rainbow Trout (0.04 – 0.21 mg/kg wet) and then Mountain Whitefish (0.05 – 0.17 mg/kg wet).

Fillet mercury was significantly higher in Walleye than other species, and increased with fork length (model $R^2 = 0.73$, $p < 0.05$). Mercury concentrations in whole body samples were marginally higher in reference sites and Walleye, and lower in males (model $R^2 = 0.79$, $p < 0.05$). Mercury levels were slightly higher in the stomachs of Rainbow Trout and Walleye but did not differ significantly between those fish sampled from reference and exposure areas (model $R^2 = 0.23$, $p < 0.05$).

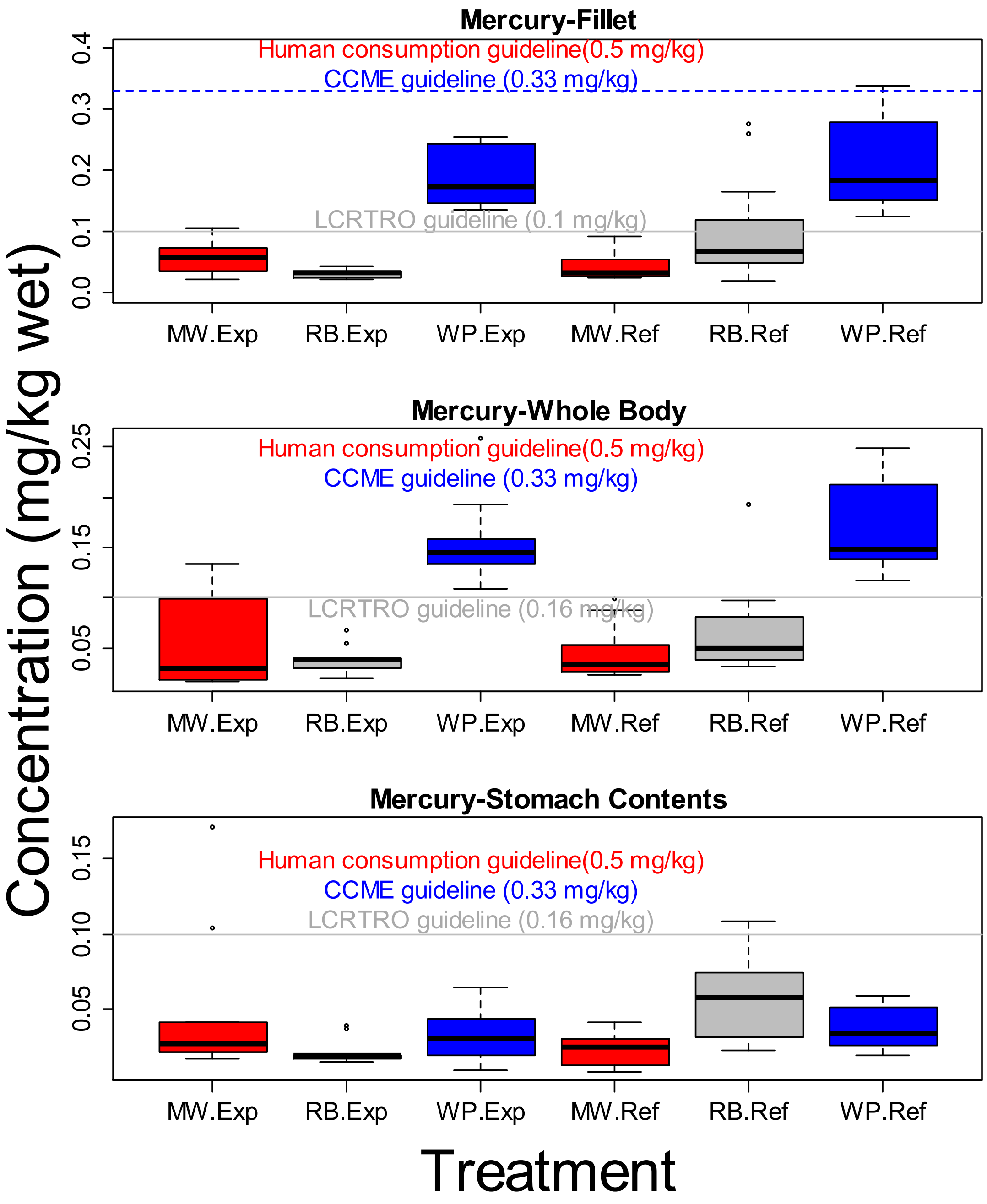


Figure 4-40: Concentrations of mercury (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively. Human consumption and wildlife guidelines are included as horizontal lines where they fall within metal concentrations.

4.5.2.7 Selenium (Se)

Selenium concentrations were highest in gut samples (Figure 4-41). The highest mean concentration was from a Mountain Whitefish caught from the reference area, which was 1.5 times greater than mean selenium concentrations of Whitefish caught from the exposure area. Aquatic life is primarily exposed to selenium through diet rather than from direct exposure in the water (BC MOE 2012).

Fillet selenium was significantly higher in exposure sites, Mountain Whitefish and male fish (model $R^2 = 0.40$, $p < 0.05$). However, these differences were generally small. Selenium concentrations in whole body samples were significantly higher in Mountain Whitefish and males, but did not differ between reference and exposure sites. Selenium concentrations in stomachs were significantly higher in exposure sites for the three species although the differences were lower in Rainbow and Walleye (model $R^2 = 0.65$, $p < 0.05$).

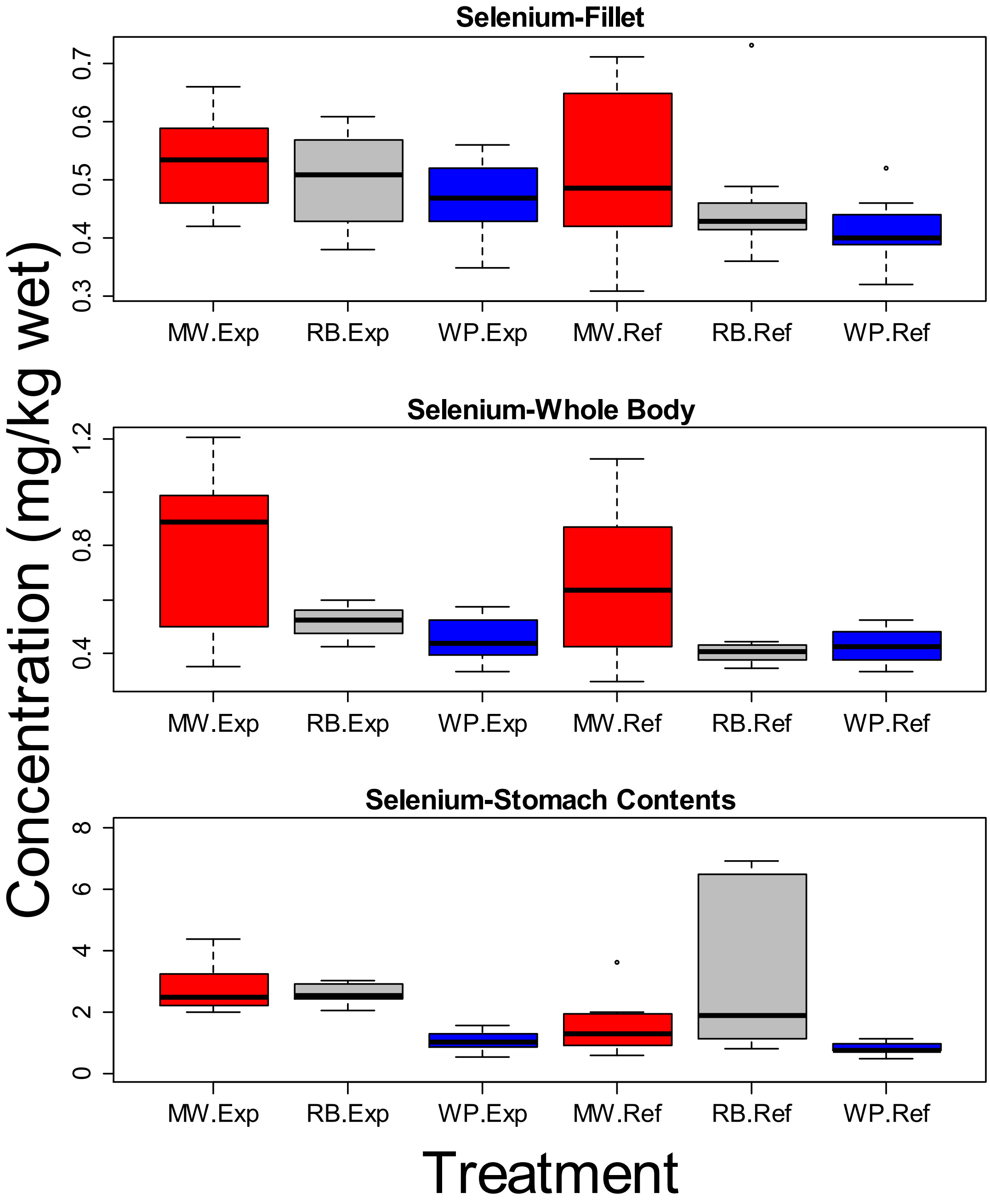


Figure 4-41: Concentrations of selenium (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively.

4.5.2.8 Thallium (Tl)

Thallium was slightly higher in fillets of Rainbow Trout and Walleye but did not differ significantly between reference and exposure areas (model $R^2 = 0.47$, $p < 0.05$) (Figure 4-42). Whole fish thallium concentrations were significantly higher in fish from the exposure area. Rainbow Trout and Walleye also had marginally higher levels, as did male individuals (model $R^2 = 0.62$, $p < 0.05$). Thallium concentrations in large body fish stomachs were significantly, higher in fish collected from exposure sites (model $R^2 = 0.43$, $p < 0.05$).

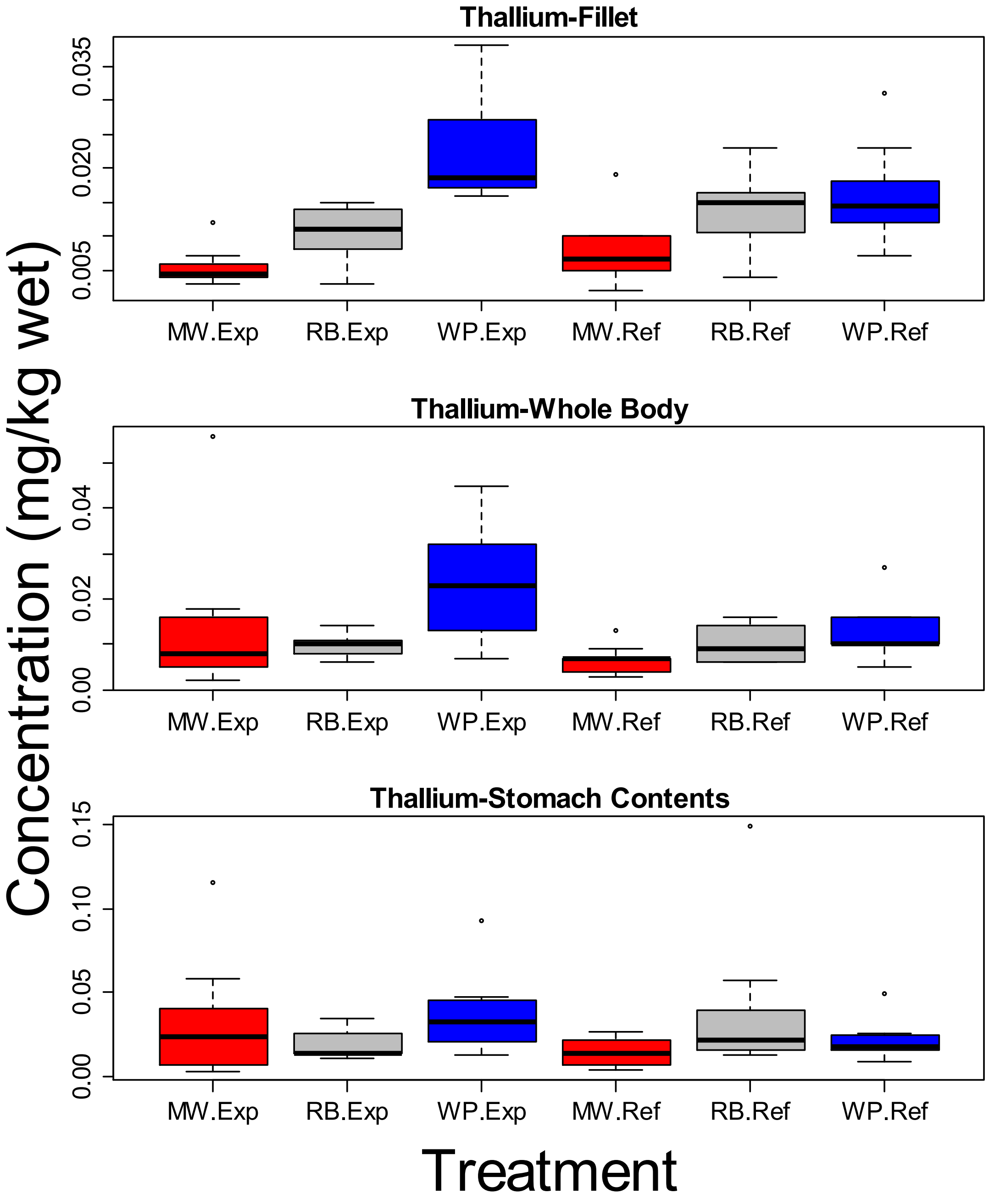


Figure 4-42: Concentrations of thallium (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively.

4.5.2.9 Zinc (Zn)

Fillet zinc did not significantly differ between reference and exposure areas, among species, sex, or lengths (Figure 4-43). Zinc concentrations in whole body samples did not differ considerably among all variables included in models but marginally decreased with fork length (model $R^2 = 0.24$, $p < 0.05$). Concentrations of zinc in stomach contents were significantly higher in exposure area fish and in Rainbow Trout, and lower in Walleye (model $R^2 = 0.61$, $p < 0.05$).

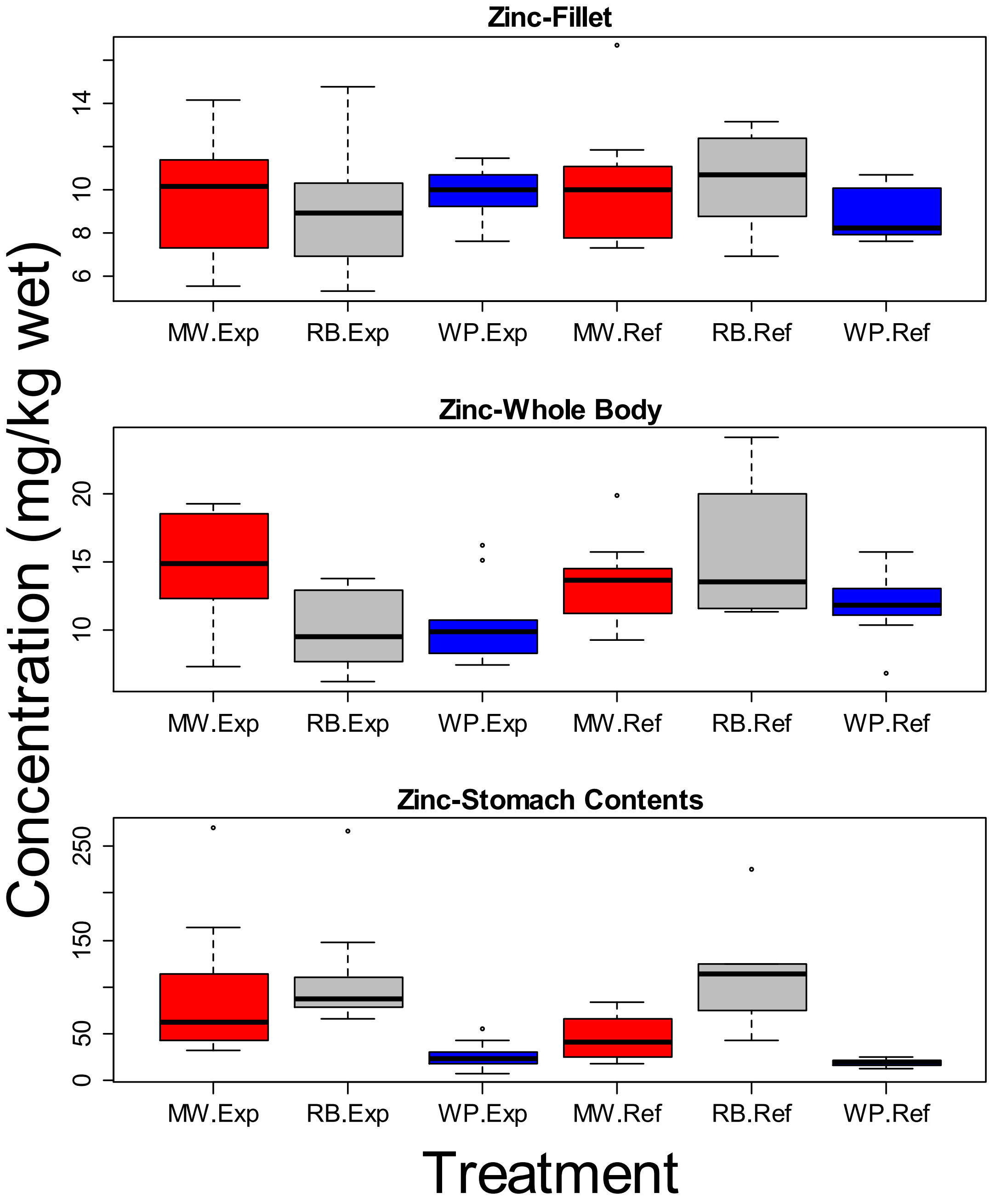


Figure 4-43: Concentrations of zinc (mg/kg wet) in fillet, whole body, and stomach content samples from Mountain White fish (MW, red), Rainbow Trout (RB, gray), and Walleye (WP, blue) collected from reference (Ref) and exposure (Exp) areas upstream and downstream of the TTS respectively.

4.5.3 Trends in Tissue Metals Concentrations

Fillet metals were compared for Mountain Whitefish, Rainbow Trout, and Walleye over the past 12 years (2000 – 2012) to evaluate trends in tissue metals concentrations for arsenic, cadmium, chromium, lead, and mercury. Figure 4-44 illustrates trends where they occur. Declining trends are evident for arsenic, cadmium, and lead. Increased detection capabilities for cadmium since 2004 demonstrate the declining trend in 2005 for Walleye, and in 2012 for all three species. However, no trend is apparent with chromium and mercury.

In spite of the apparent trends for some of the metals it should be noted there is uncertainty in regards to how past data was collected and processed in the different studies (e.g. sample size, location, collection timing, tissue extraction and processing, etc.). This uncertainly places limitations on the extent to which these trends can be interpreted and conclusions drawn.

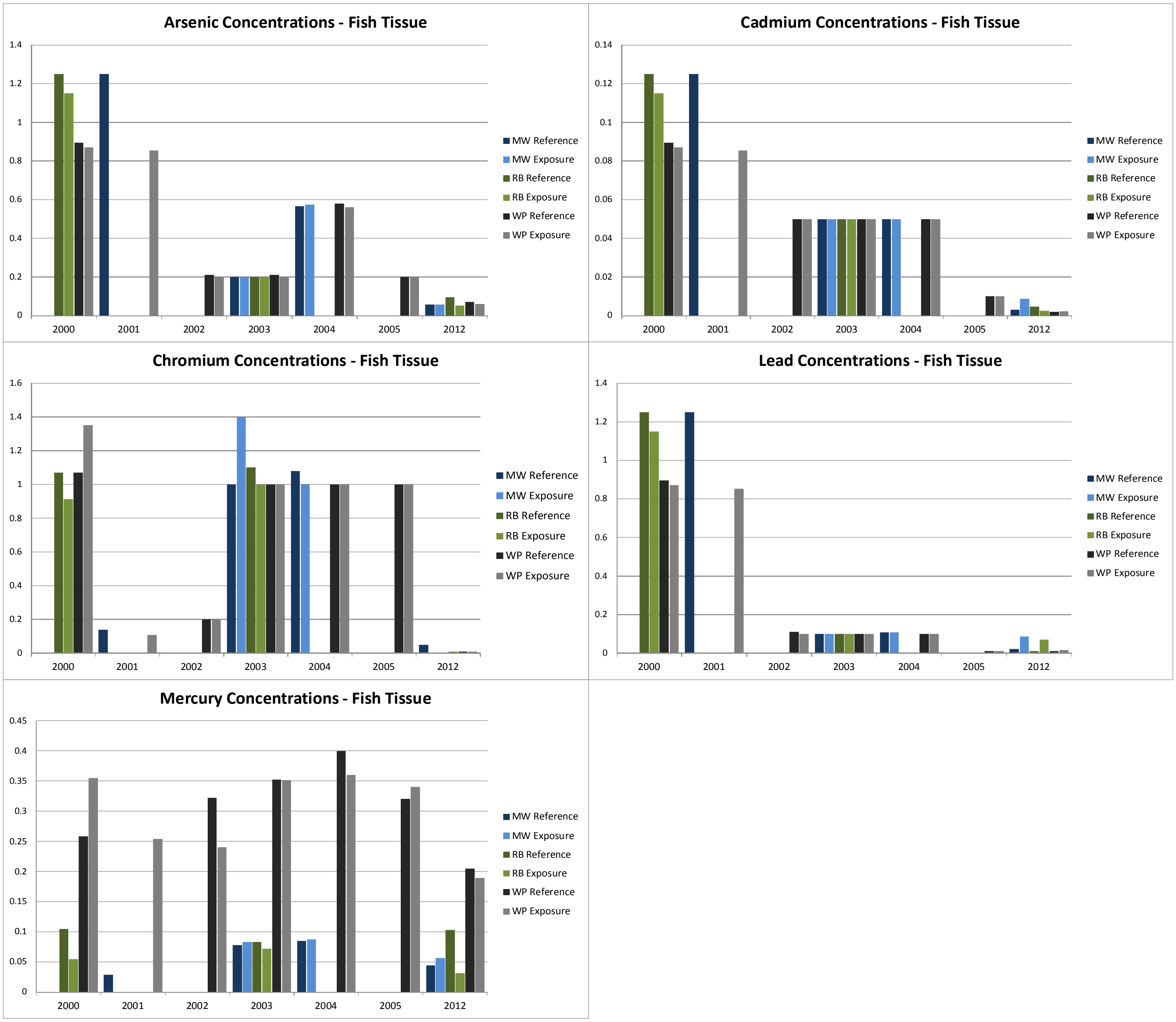


Figure 4-44: Trends in metal concentrations in LCR fish tissue (fillets) from 2000-2012.

4.6 Small Bodied Fish Condition and Tissue Metals Monitoring

Sampling was carried out from May 13 – 16, 2013. During this time female sculpin were notably gravid. The initial objective was to sample Prickly Sculpin. However, early in sampling effort, it became apparent that Torrent Sculpin (Figure 45) were the predominant target species within near-shore areas that could be safely sampled.

Figure 4-45: Common sculpins collected during spring 2013 sampling program. From left to right: Torrent Sculpin, Columbia Sculpin, Shorthead Sculpin.

A total of 795 small fish were collected over the 4-day period. Columbia Sculpin (Figure 45) was encountered most frequently during sampling with Torrent Sculpin and Shorthead Sculpin each accounting approximately 25 % of the catch (Table 4-24). Prickly Sculpin accounted for just 4% of the total catch. A total of 240 sculpin (8 Prickly, 38 Columbia, and 194 Torrent) were retained for analysis of tissue metals and condition. Ninety-nine sculpin were from reference areas and 141 were collected from exposure areas (Schedule A – Mapsheets).

Table 4-24: Small-bodied fish collection summary. Fish were collected May 13-16, 2013 from the mainstem of the Columbia River with a backpack electrofisher and pole seine.

Species	Percent sample abundance
Columbia Sculpin (*Cottus hubbsi*)	36%
Torrent Sculpin (*Cottus rhotheus*)	26%
Shorthead Sculpin (*Cottus confuses*)	25%
Longnose Dace (*Rhinichthys cataractae*)	4%
Prickly Sculpin (*Cottus asper*)	4%
Northern Pikeminnow (*Ptychocheilus oregonensis)*	3%
Redside Shiner (*Richardsonius bateatus*)	1%
Rainbow Trout (*Oncorhynchus mykiss*)	1%
Umatilla Dace (*Rhinichthys umatilla*)	<1%
Sucker sp. (*Catastomus sp.*)	<1%

4.6.1 Sculpin Condition Metrics

There was no significant difference ($p > 0.05$) in the three measured sculpin condition responses (within sex) between reference and exposure areas and effects of the smelter were not detected (Figure 4-46, Appendix I). This was also true for condition measured as body weight corrected for fish length, and liver, and gonad corrected for total body weight. (Appendix I). Liversomatic values were lower in fish collected from ERO-EXP-1 just downstream of Stoney Creek and Outfall CIV. However higher liversomatic scores were recorded for fish collected within the CII and CIII effluent discharges (Golder 2012, Hawes and Larratt 2013) of the IDZ.

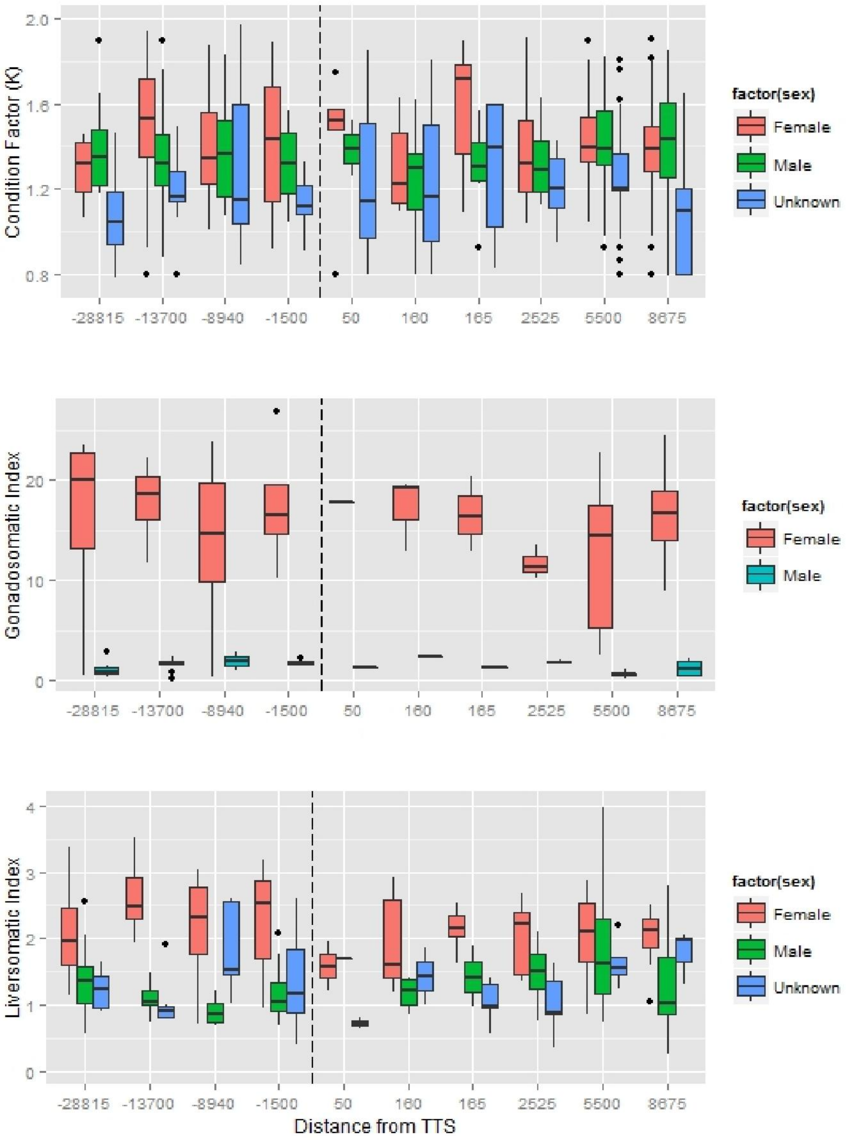


Figure 4-46: Sculpin condition metrics taken from fish collected during the May 2013 small-bodied fish sampling program. Plotted data to the left of the vertical dashed line are upstream reference areas and those to the right of the line are exposure areas.

4.6.2 Sculpin Tissue Metals

Differences in metals concentrations between sculpin collected in reference and exposure areas were relatively low in all cases except for lead, where sculpin in exposure sites generally had higher lead levels. However these differences were statistically significant ($P < 0.05$) for all metals of interest except for chromium and selenium (Figure 4-47, Appendix I). In all cases but iron, selenium, and chromium, metal concentrations were also somewhat higher in smaller sculpin. In most cases metal concentrations in sculpin were below TRO guidelines in both reference and exposure sites. However some exceedances were observed. Three sculpins were found to have arsenic levels above the wildlife TRO of 0.47 µg/g wet weight and 186 sculpin were found to have lead concentrations above wildlife TRO (0.16 µg/g wet weight), with 47 of these fish sampled from reference sites. The maximum whole fish lead concentration measured for a near-field sculpin was 11 µg/g wet weight. The average % moisture of homogenized whole fish samples was 76.1% ±2.9.

Although overall differences in metals concentrations were small between reference and exposure treatments, a strong near-field response was observed in fish sampled from the IDZ (ERO-EXP-2) and decreased moving downstream from the TTS (Figure 4-48). In spite of the elevated near-field metals concentrations, there was no difference in the condition (k), gonadsomatic index, and liversomatic index of fish collected within near-field areas and overall, there was no difference in these condition metrics between reference and exposure treatments.

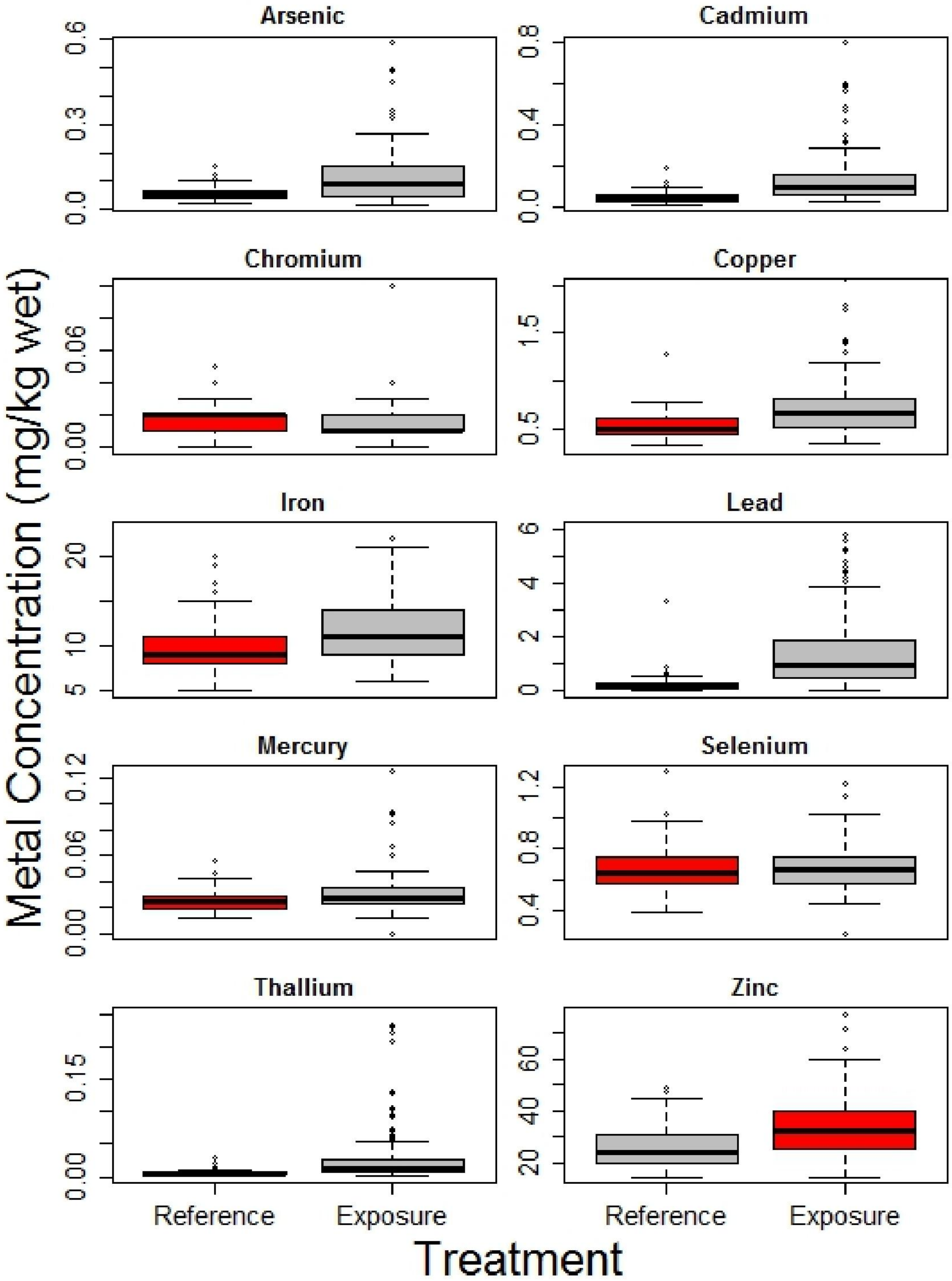


Figure 4-47: Metal concentrations (mg/kg wet) in whole body sculpin samples in reference and exposure above and below TTS outflow respectively.

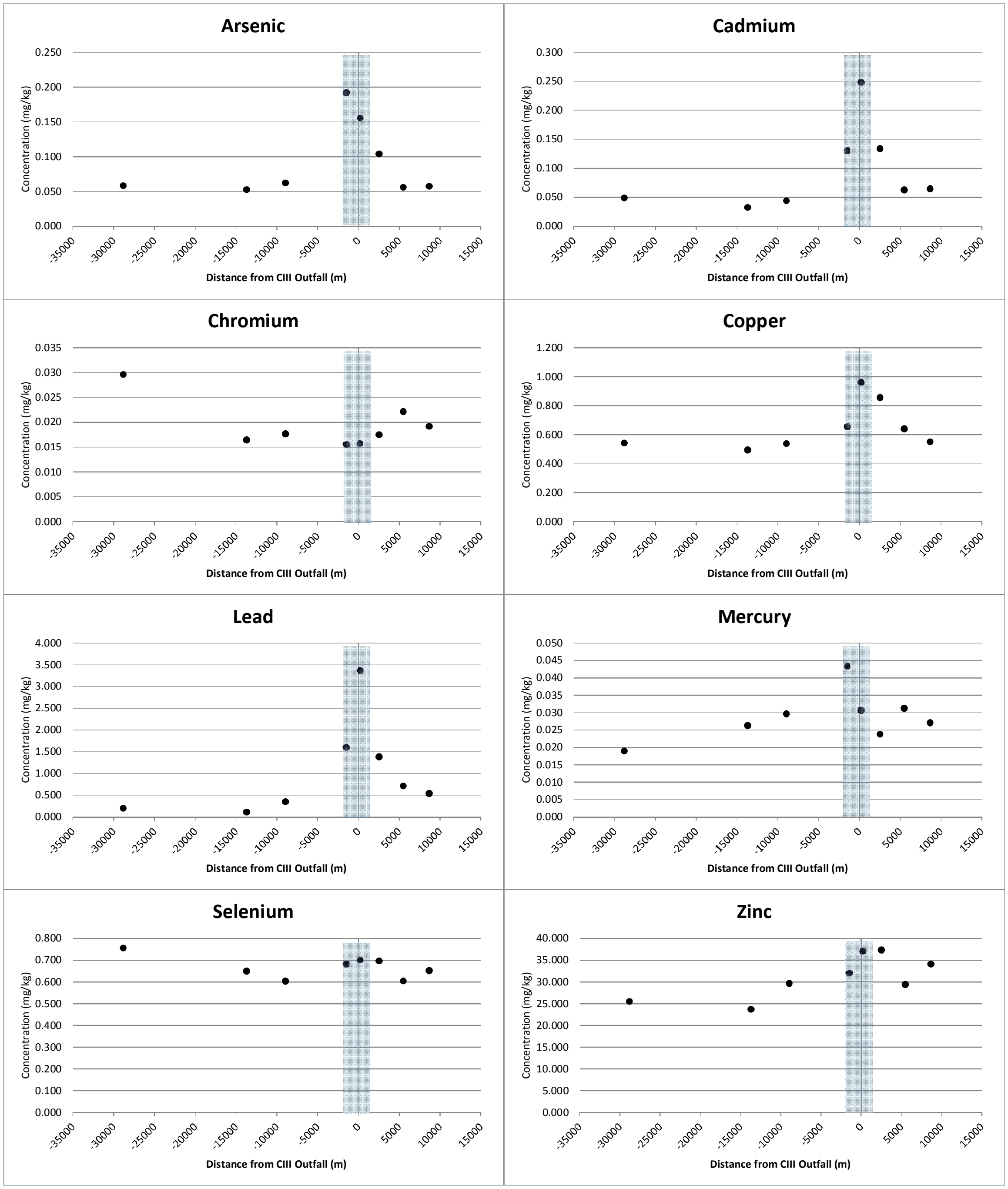


Figure 4-48: Mean sculpin tissue metals concentrations demonstrating the near-field response within the initial dilution zone (shaded area). The x-axis represents the distance from the TTS-Outfall CIII (0-m); where negative values indicate the distance upstream (m) and positive values indicate distance downstream.

4.7 Wildlife Health

Results of the wildlife health modelling are presented under separate cover (Intrinsik 2013), which is included as Appendix J. Intrinsik (2013) concluded that,

> *"The exposure ratios (ER) predicted by the modelling demonstrated that none of the wildlife receptors are exposed to concentrations associated with adverse effects (probability of predicted ER value greater than 1.0 was less than 10%). The confidence in these predicted values is adequate to rule out risk due to the measured concentrations in fish, benthic invertebrates, sediment and surface water. Therefore, it can be concluded that the receptors are not exposed to unacceptable concentrations of potential metals of interest through their aquatic diets.*
>
> *Site-specific effect threshold concentrations were calculated for those PMOC and receptor combinations that had a probability of ER value greater than or equal to 1 of at least 1%:*
>
> - *Belted kingfisher (chromium, lead, mercury-inorganic and selenium);*
> - *Great blue heron (zinc);*
> - *Mallard (chromium, lead, mercury-inorganic and selenium); and*
> - *Otter (arsenic)."*

5.0 SUMMARY AND CONCLUSIONS

5.1 Water quality

In brief, the purpose of the AREMP water quality component is the development of a long-term monitoring program to evaluate the effects of Teck's permitted effluent discharges on the LCR. Key questions include:

1. Are Provincial Water Quality Objectives attained at the downstream end of the Initial Dilution Zone during low flows (less than 40 kcfs) as per long-term trend monitoring?
2. Does water quality in the study area vary spatially in the Columbia River including point source discharge sites and reference sites, and temporally as a result of Teck's point source effluent discharges?
3. Are water quality parameters that are analyzed at the AREMP stations appropriate?

The water quality study was designed and implemented to address these general management questions.

5.1.1 Attainment of water quality objectives

Most Provincial water quality objectives were attained at the downstream end of the IDZ during low flows at the Old Bridge site in 2012 data. The only exceptions were mercury and cadmium, but both of those metals exceeded the objectives or guidelines at the reference sites as well. One exceedance for lead occurred at Waneta Eddy in July 2012.

When the 2012/2012 water quality data are compared to data sets collected over the past decade, improvement in LCR water quality is evident, resulting in a shorter list of metals of interest and far fewer exceedances. All metals of interest showed diminishing concentrations from 2003 to present (Hatfield 2008).

In this study, nutrient concentrations in the LCR below the IDZ were not significantly altered by the effluent discharges. The largest nutrient inputs were above the Birchbank reference site and likely include Celgar, the City of Castlegar, the BC Hydro Arrow and Kootenay Lakes fertilization programs. All nutrients remained within their respective water quality objectives throughout the LCR.

5.1.2 Spatial and temporal variation in water quality

The AREMP transect water quality sampling showed spatial variation in water quality within the IDZ. Adjacent to the smelter, groundwater and permitted effluent discharges mix, resulting in the highest metals values in right bank samples within the IDZ. The largest intrusions of groundwater occur during low flows along both banks within the IDZ. The effluent plumes continue to travel and dilute along the R bank below the IDZ. No across-channel variations were detected in metals samples from the far field Waneta site.

Spatial upstream to downstream trends were detected by the 2012 – 2013 transect sampling for many metals including As, Cd, Cr, Cu, Pb, Ni, Se, Tl, and Zn. Within the IDZ, metal sources likely include effluent and groundwater discharges, and Stoney and Trail Creeks. Other potential sources of compounds of interest to the LCR downstream of the smelter include stormwater, historical mining and milling, municipal effluent and naturally elevated metals in tributaries.

None of the LCR samples approached the inorganic nitrogen guidelines for aquatic life. In the 2012-13 data, ammonia exceedances were confined to the New Bridge site within the IDZ, and they were most common in April low flow samples along the shorelines. Similarly, sulphate, phosphorus and potassium concentrations were elevated along the R bank of the IDZ, but had returned to reference concentrations by Waneta Eddy.

5.1.3 Water quality study design

The overall AREMP water quality study design meets the goals of assessing smelter impacts. It focusses on the lower flow periods where mixing and dilution are reduced and impacts are expected to be greatest.

Water quality parameters currently used are appropriate; particularly the ultra-low metals detection procedures. Because of the importance of the groundwater-donated dissolved nitrogen species; ammonia, nitrate and nitrite, analysis of total kjeldahl nitrogen was added to the analysis list in 2013 to capture organic nitrogen and enable the calculation of total nitrogen. Similarly, total organic carbon was added to the analysis list to better understand its important interactions with dissolved metals.

5.2 Depositional habitat

The objective of the depositional habitat component of the AREMP is to assess TML's permitted effluent discharge on depositional benthic communities by comparing benthic invertebrate structure and composition between areas upstream (reference) and downstream (exposure) of the smelter. Key questions for this component include:

1. What is the sediment quality in the depositional areas upstream and downstream of the smelter?
2. Are periphyton on depositional sediments downstream of the smelter different from the upstream communities in terms of abundance, species diversity and biovolume?
3. Are the benthic invertebrate communities in depositional sediments downstream of the smelter different from the upstream communities in terms of abundance, species diversity and species composition?
4. If differences in benthic communities exist, do these differences suggest adverse effects (i.e. impairment of benthic communities such that they provide poor habitat to upper trophic consumers) and is this linked to current permitted effluent discharges?

5.2.1 Area of depositional zones in the LCR area of interest

Hydrodynamics of the Columbia River in the study area create conditions where long-term depositional zones are expected to be rare (Golder, 2003). The spatial extent of depositional habitat in the LCR is small. Depositional sediments account for approximately 33 ha or 2% of the total area of the LCR between HLK Dam and the Canada-US border. Within the area of interest, depositional habitat was estimated at 0.1% of the total sediment habitat (Golder 2007c). The importance of these depositional areas is limited by their small contribution to the overall LCR habitat.

5.2.2 Sediment quality in depositional areas of the LCR

Sediment chemistry of depositional areas in the LCR was distinct from erosional cobble substrates. Depositional sediments tend to develop lower dissolved oxygen, lower redox, elevated organic components and therefore, unique microflora communities dominated by decomposers.

The length of time that deposited materials remain in depositional areas is also important. Larger depositional sites such as Waneta Eddy and Genelle Eddy can be expected to have longer storage than small depositional sites. These large depositional sites can be expected to take longer to return to a natural state than adjacent erosional sites.

Fines that accumulated during low flows are frequently scoured and re-sorted during high flows (Parametrix et al., 2010). Estimates of percent slag in this study were low, although visually identifying slag particulates proved difficult, and field visual estimates completed in earlier studies would have been even less certain. The record-setting freshets in 2011 and 2012 may have scoured out the depositional areas in the AOI, removing fines and uprooting aquatic macrophyte beds.

Metals in depositional exposure sites that exceeded one standard deviation of results from reference sites were: aluminum, arsenic, cadmium, chromium, manganese, and of these, aluminum and manganese concentrations are not attributable to the smelter. Metals in depositional exposure sites that exceeded two standard deviations of results from reference sites were: copper, lead and zinc. However, similar lead concentrations occurred in stream sediments adjacent to the depositional sample sites which were not impacted by the smelter (Reyes et al., 2004).

Every depositional sediment metal concentration metric available shows decreasing concentrations of all metals of interest from 2003 to 2012 particularly in exposure sites downstream of the smelter. In 2012 data, the list of metals exceeding possible effects level concentrations or sensitive species levels was Zn, Pb, Cu, and As.

5.2.3 Depositional periphyton community health

Depositional periphyton communities throughout the LCR have lower overall productivity, include more diatoms settling out from reservoir releases, accumulate more organic debris and have more decomposer components in the biofilm than adjacent erosional cobble substrates. Large eddies including Waneta Eddy and Genelle Eddy had the lowest productivity, probably in response to unique habitat features.

There was no detectable impact of sediment metal concentrations on depositional periphyton community structure or standing crop. Similarly, there was no detectable impact of current effluent discharges on depositional periphyton community structure or standing crop. In fact most growth metrics were higher at the depositional sites downstream of the smelter than they were in the upstream reference sites.

5.2.4 Depositional benthic invertebrate community health

Benthic macroinvertebrates reside in and on sediments of the LCR (Bortleson et al. 2001). They typically are a key part of aquatic food webs because they consume zooplankton, plants (e.g., phytoplankton, algae, and macrophytes), and detritus. In turn, they constitute prey for other macroinvertebrates, fish, and wildlife.

A community analysis (i.e., NMDS) of 2012 samples detected no change in invertebrate community structure between reference and exposure areas. However, increasing distance downstream and metals group 1, driven by zinc and copper, had a negative effect on invertebrate abundance, species richness, and percent *Chironomidae* in depositional habitats. Metals group 2 had a high positive correlation coefficient for EPT richness and species diversity.

The apparent diminished response at Maglios and Waneta in 2012 (compared to previous studies) may be a result of continual scour and redeposition of sediments, which may have been exacerbated by the record high flows experienced in the LCR in summer 2012 (roughly equal to the upper quartile for a 76 year period of record; Water Survey of Canada 2013). At the same time, this response may be simply due to annual variation in benthic community production.

5.3 Erosional Habitat

The main objectives of the AREMP erosional habitat sampling are to assess potential effects of the effluent discharge on erosional periphyton communities in terms of community structure, composition, and standing crop biomass, and to detect any trends over time. Key questions to be addressed were:

1. What is the difference in erosional periphyton communities in erosional habitat downstream of the smelter compared to the upstream communities in terms of community structure, composition, and standing crop biomass?

2. What is the difference in the erosional benthic invertebrate communities in erosional habitat downstream of the smelter compared to the upstream communities in terms of community structure and composition?
3. On the basis of qualitative review, is there a trend in periphyton and benthic metrics over time?

5.3.1 Erosional periphyton community health

In riverine cobble substrates, localized variability in species distribution is very high. As in all large rivers, LCR periphyton continues to show wide natural variance in abundance within and between sites, including reference and exposure sites. Similarly, there was little indication of a spatial trend in the presence of algae classes with distance upstream or downstream of the smelter in the 1995, 2003 or 2012 data. In this AREMP, all metrics and statistical analyses conducted on the 2012 data did not detect any impact on erosional periphyton attributable to the smelter.

Diatoms are the most prevalent type of algae in erosional river biofilms. The dominant species lists did not indicate measurable change between the erosional reference and exposure sites. Within the IDZ where warm effluent and warm, comparatively nutrient-rich groundwater can infiltrate the river, a shift to increased concentrations of cyanobacteria and filamentous green algae were detected. This shift did not appear to be in response to metal concentrations and is not necessarily deleterious.

Major driving forces on LCR periphyton communities include flows and localized water velocity, irradiance, nutrient concentrations, algae settling from upstream reservoirs and grazing pressure. Metal concentrations did not exceed potential effects levels, and did not measurably affect any growth metric in the 2012 data. Other stressors such as flow regime drive the community as they do in most large river systems.

Previous studies found similar periphyton community structures as found in this study but with higher productivity. Prior studies over the years may have used different methodologies, and the timing of sampling with recent flow patterns are also strong determinants of periphyton standing crop. Despite these caveats, trends in periphyton community metrics have been stable over the past decade. Recovery of the erosional periphyton downstream of the IDZ first detected in 1999 (McElligott et al. 2001a) is either continuing or is complete.

5.3.2 Erosional habitat benthic invertebrate community health

In contrast to depositional habitats, erosional habitats in exposure areas were documented as having higher mean invertebrate abundance compared to reference sites. The greatest sampled abundance was recorded in the nearfield exposure area just downstream of TTS Outfall CIII. Here, EPT accounted approximately 99.5% of the community. Overall species richness was unchanged between reference and exposure areas and species diversity was also similar between reference and exposure sites. The mean EPT richness and mean %EPT were both higher in exposure areas and mean Hilsenhoff Biotic Index score was less than reference sites. This indicates a greater predominance of pollution sensitive species downstream of the TTS.

The community analysis (NMDS) detected no shifts in community composition between reference and exposure areas. Based on comparison with reference sites, benthic invertebrate community health is good in erosional habitats downstream of the TTS.

Mixed effects models indicated that water velocity is the most important covariate influencing invertebrate abundance, EPT richness, percent EPT, and diversity in LCR erosional habitats. In addition, the models suggest that the effect of reference and exposure treatment may not be the controlling factor in invertebrate species abundance, community richness, or diversity.

5.4 Small Bodied Fish

The 2013 small-bodied fish study was designed to address the following monitoring questions:

1. Is there a difference in tissue metals composition and concentration in small-bodied fish between reference sites and exposure sites upstream downstream of the TTS respectively?
2. Do tissue metal concentrations decrease in small bodied fish as the distance from the smelter effluent discharge increases?
3. Is there a difference in the length, weight, liver weight, gonad weight and condition of fish collected upstream of the TTS and downstream of the TTS?
4. What is the relationship between the distance from the effluent discharges and tissue metals, condition factor, liver weight (liversomatic index) and gonad weight (gonadosomatic index)?

Differences in concentrations between sculpin collected in reference and exposure sites were relatively low, yet statistically significant in all cases. Although overall differences in metals concentrations of fish were small between reference and exposure treatments, a strong near-field response was apparent in fish sampled from the IDZ and decreased moving downstream from the TTS. This gradient in response at the exposure sites may be a correlate to progressive dilution moving downstream away from the TTS.

Sculpin species have been shown to be highly sensitive to zinc, cadmium and copper (Besser et al. 2007). While a near-field response in sculpin was evident by elevated tissue metals concentrations, there was no significant difference in condition responses between reference and exposure areas. Woodling et al. (2002) found that for Mottled Sculpin (*C. bairdi*) the 30-day chronic no effect and lowest effect concentration of dissolved zinc was 0.016 mg/L. Along the right bank within the IDZ at the New Bridge, mean concentrations of dissolved zinc were 0.013 mg/L, and the maximum recorded zinc concentration at low LCR flows was 0.0146 mg/L. Assuming that LCR sculpin have a similar sensitivity to metals, the observed concentrations of zinc within the IDZ are not anticipated to have chronic effects.

5.5 Large Bodied Fish

The large-bodied fish program was recommended to be undertaken every 3-5 years (Golder 2012a). This study aimed to address the following monitoring questions:

1. How do the concentrations of total metals in the tissues of three large bodied fish species in the lower Columbia in 2012 compare to the concentrations since 2000?

2. Is there a difference in the concentration of metals in large bodied fish captured from reference areas and exposure areas?

3. Do the fish tissue concentrations exceed relevant human consumption guidelines?

Since 2000 declining trends are evident for arsenic, cadmium, and lead concentrations in fillets of Mountain Whitefish, Rainbow Trout, and Walleye. Increased detection capabilities for cadmium since 2004 suggest a declining trend in 2005 for Walleye, and in 2012 for all three species. However, no trend is apparent with chromium and mercury at with the current data.

Metals concentrations differed significantly between species and tissue type. These differences are probably driven primarily by the different life histories and feeding habits. There was no significant effect of treatment (i.e. reference/exposure areas), fork length, or sex, or an interaction between treatment and sex for Mountain Whitefish and Rainbow Trout condition (k). Walleye condition was somewhat higher in fish collected from the reference area than those collected from the exposure area. This increased condition may simply be a result of improved forage conditions (i.e., higher prey fish populations) in the upstream reaches of the LCR near Castlegar.

Concentrations of metals in fillets do not appear to pose an unacceptable health concern to people who consume fish. Some metals (Cd, Pb, Se) had statistically significantly higher concentrations in fillets of fish collected from the exposure area. However, these concentrations were within the published guidelines for human consumption in Canada (Canadian Food Inspection Agency 2011). Other metals (As, Cu, Cr, Hg, Tl, Zn) did not differ significantly between reference and exposure area fish of the same species. Mountain Whitefish and Rainbow Trout had higher gut metals concentrations than walleye.

5.6 Wildlife Health

Objectives of the wildlife component (Intrinsik 2013) of the AREMP were to:

1. Determine the current risks to wildlife receptors - Belted Kingfisher, Great Blue Heron, Mallard, Osprey, and the River Otter in the Lower Columbia River based on current (2012/2013) data.

2. Evaluate how current risks relate to those predicted in the terrestrial ERA (Cantox Environmental 2003, Intrinsik 2007).

Predicted exposure ratios (ERs) demonstrated that none of the wildlife receptors are exposed to concentrations associated with adverse effects (probability of predicted ER value greater than 1.0 was less than 10%). The confidence in these predicted values is adequate to rule out risks, due to the measured concentrations in fish, benthic invertebrates, sediment and surface water.

Therefore, it can be concluded that the receptors are not exposed to unacceptable concentrations of potential metals of concern.

6.0 CLOSURE

This report has been prepared exclusively for Teck Metals Ltd.

If you have any questions pertaining to this report, you may contact the undersigned at your convenience.

Respectfully Submitted,
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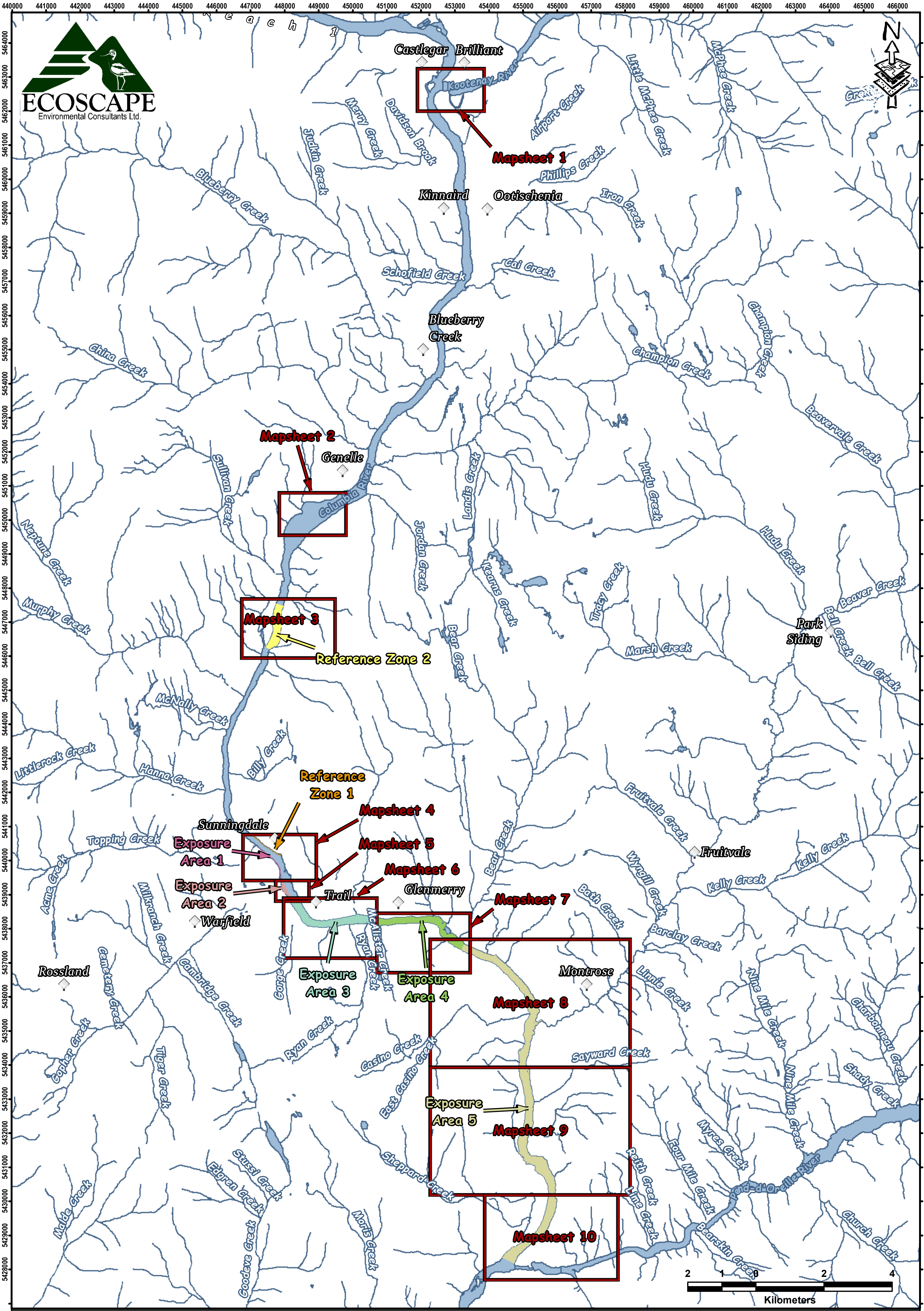
SCHEDULE - A

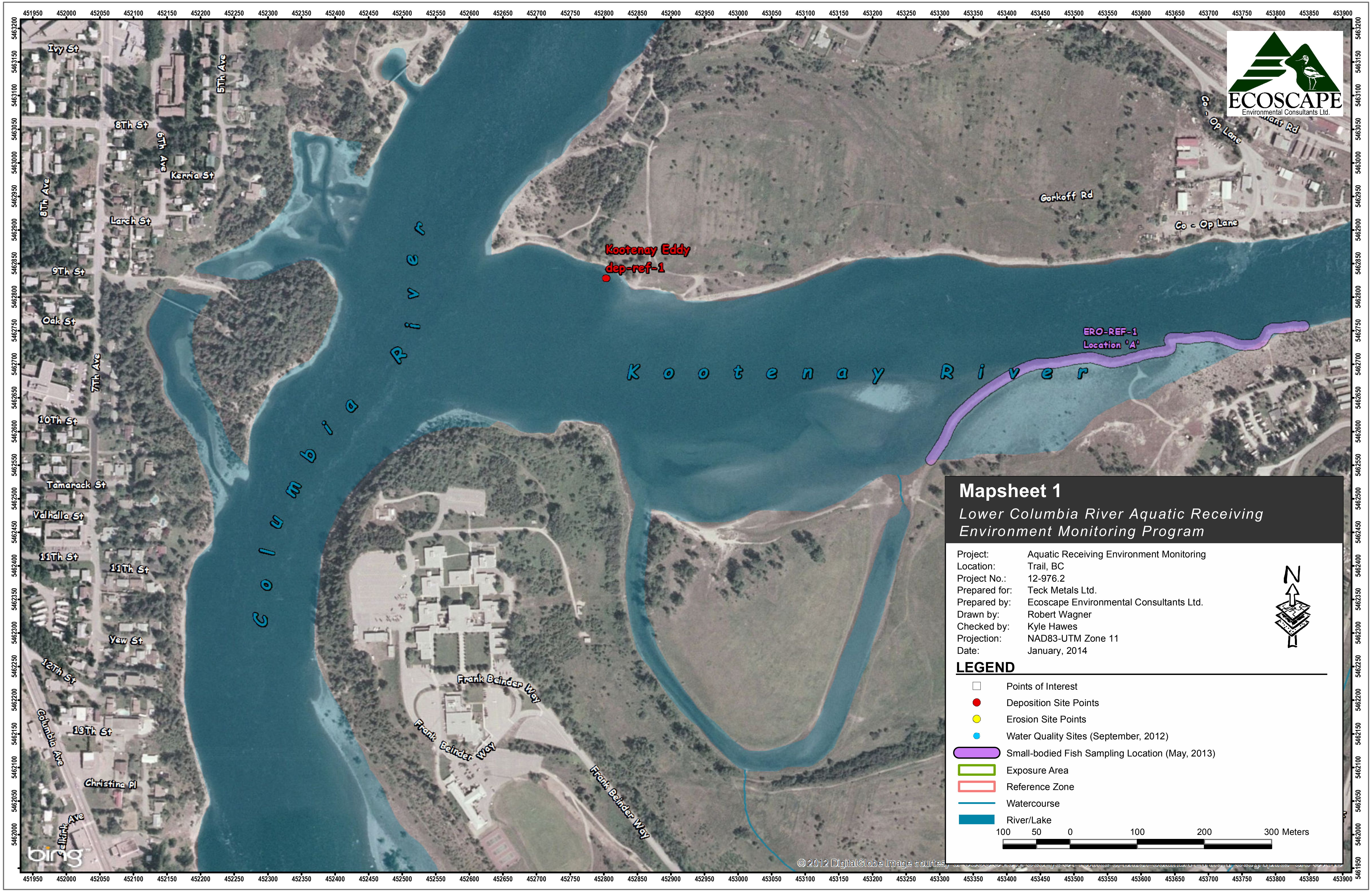
MAP SHEETS



Lower Columbia River Aquatic Receiving Environment Monitoring Program

Teck Metals Ltd.

Mapsheet Index



Mapsheet 1

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project: Aquatic Receiving Environment Monitoring
Location: Trail, BC
Project No.: 12-976.2
Prepared for: Teck Metals Ltd.
Prepared by: Ecoscape Environmental Consultants Ltd.
Drawn by: Robert Wagner
Checked by: Kyle Hawes
Projection: NAD83-UTM Zone 11
Date: January, 2014

LEGEND

☐	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
▭	Exposure Area
▭	Reference Zone
—	Watercourse
▬	River/Lake

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Mapsheet 2

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

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●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
☐	Exposure Area
☐	Reference Zone
─	Watercourse
▬	River/Lake

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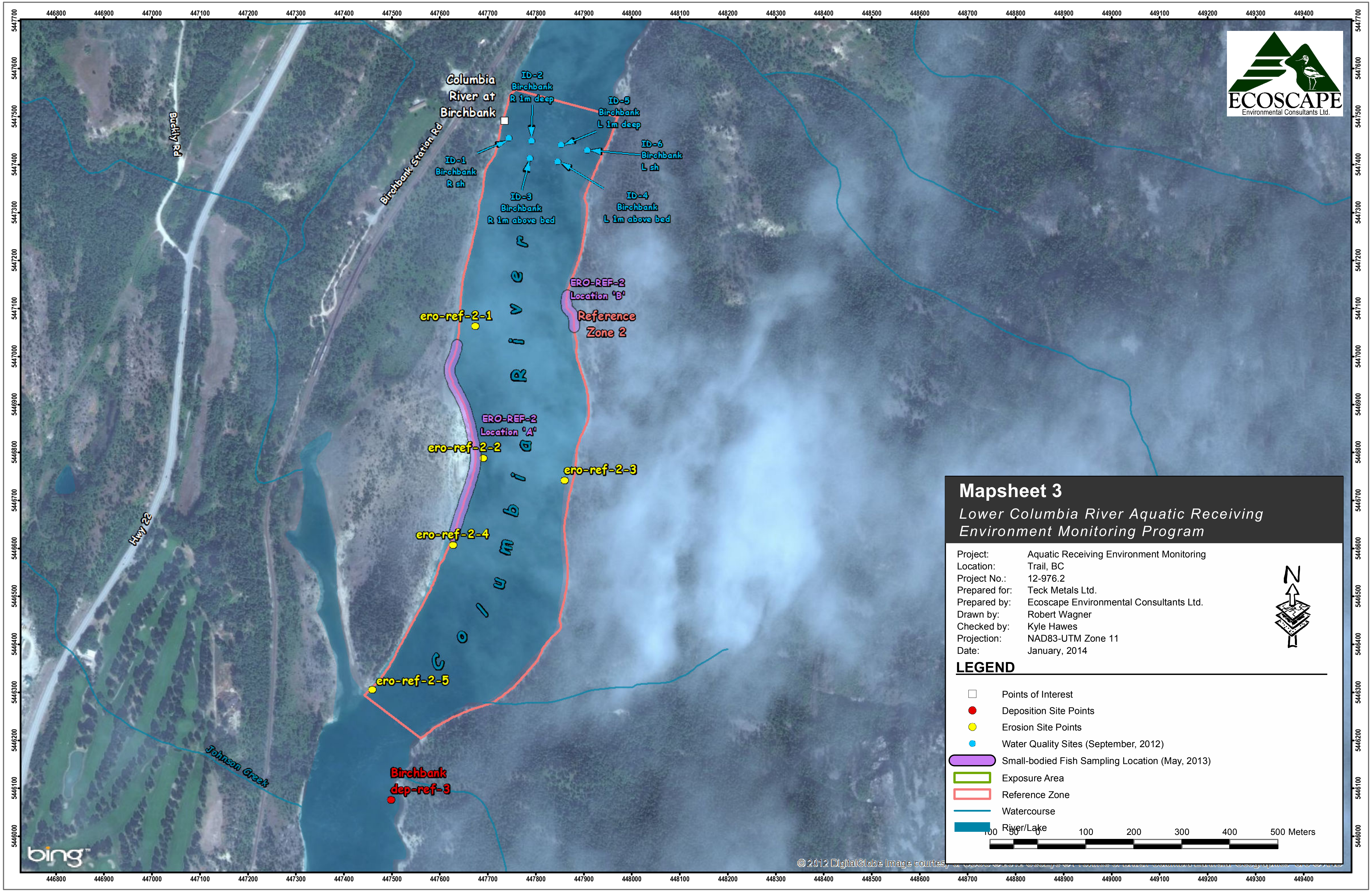


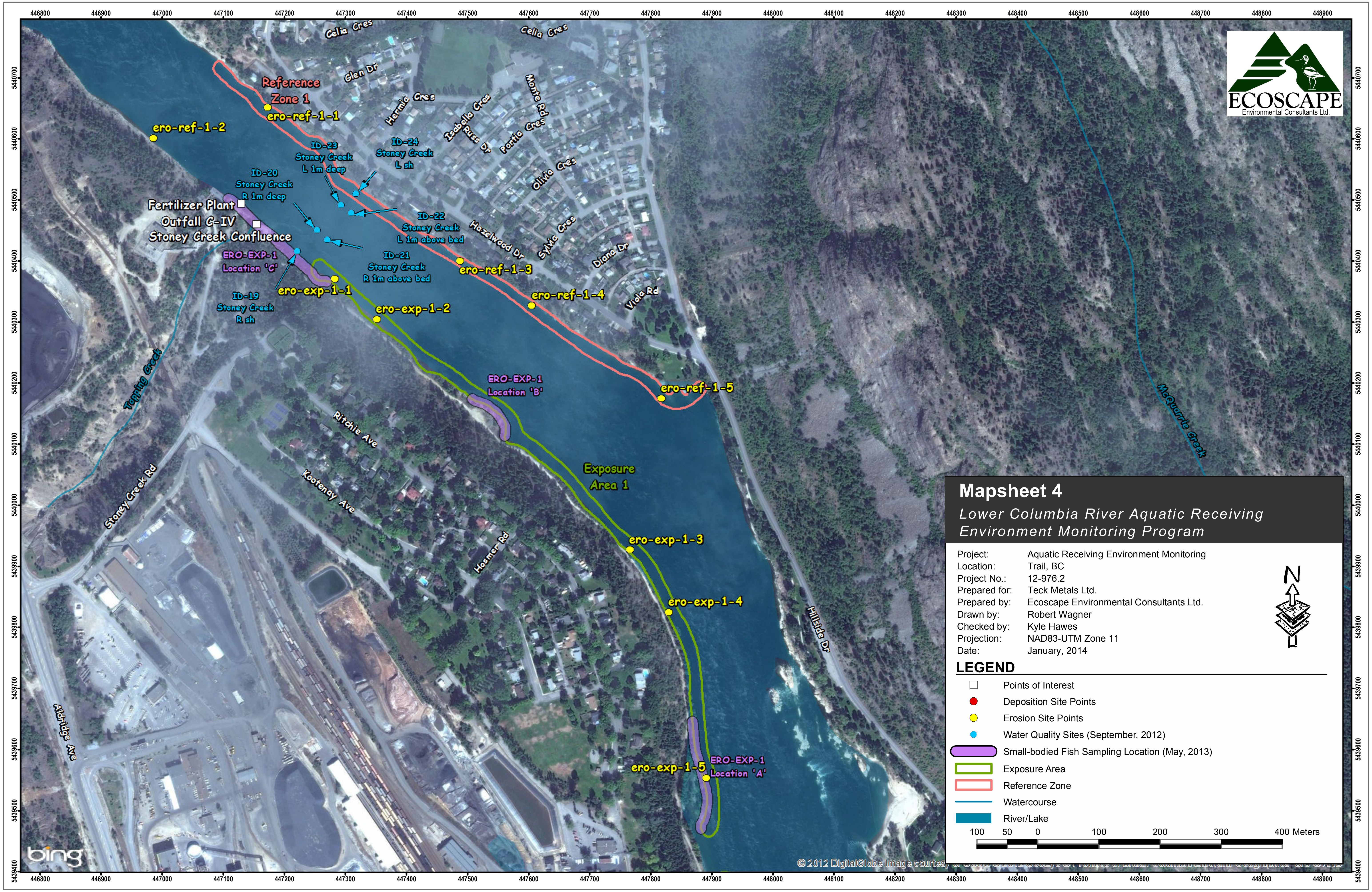
Mapsheet 3

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

☐	Points of Interest
🔴	Deposition Site Points
🟡	Erosion Site Points
🔵	Water Quality Sites (September, 2012)
🟪	Small-bodied Fish Sampling Location (May, 2013)
🟩	Exposure Area
🟥	Reference Zone
—	Watercourse
🟦	River/Lake



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Project: Aquatic Receiving Environment Monitoring
Location: Trail, BC
Project No.: 12-976.2
Prepared for: Teck Metals Ltd.
Prepared by: Ecoscape Environmental Consultants Ltd.
Drawn by: Robert Wagner
Checked by: Kyle Hawes
Projection: NAD83-UTM Zone 11
Date: January, 2014

N

LEGEND

- ☐ Points of Interest
- ● Deposition Site Points
- ● Erosion Site Points
- ● Water Quality Sites (September, 2012)
- ▬ Small-bodied Fish Sampling Location (May, 2013)
- ☐ Exposure Area
- ☐ Reference Zone
- — Watercourse
- ▬ River/Lake

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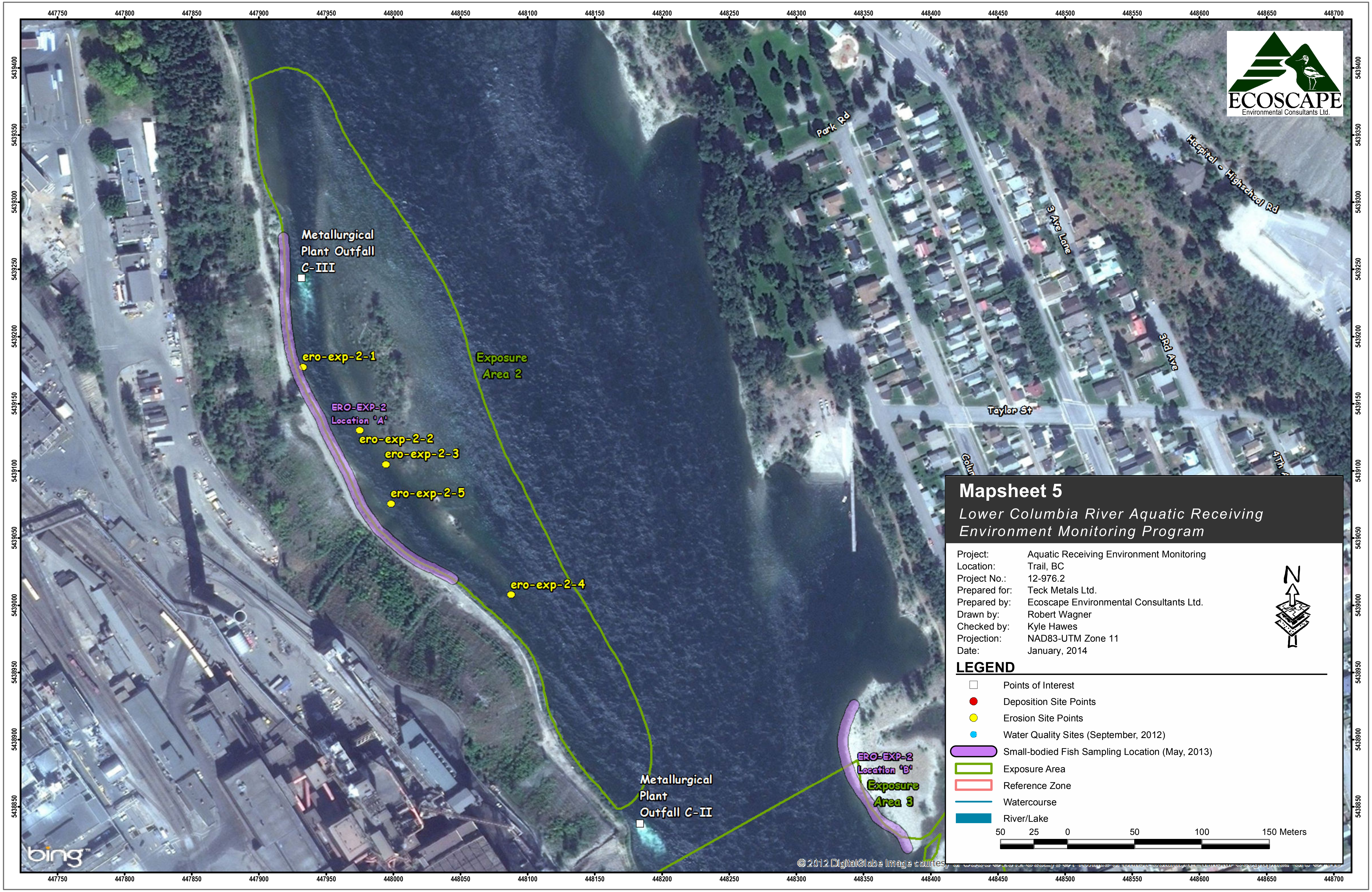

Mapsheet 5

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

☐	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
▭	Exposure Area
▭	Reference Zone
―	Watercourse
■	River/Lake

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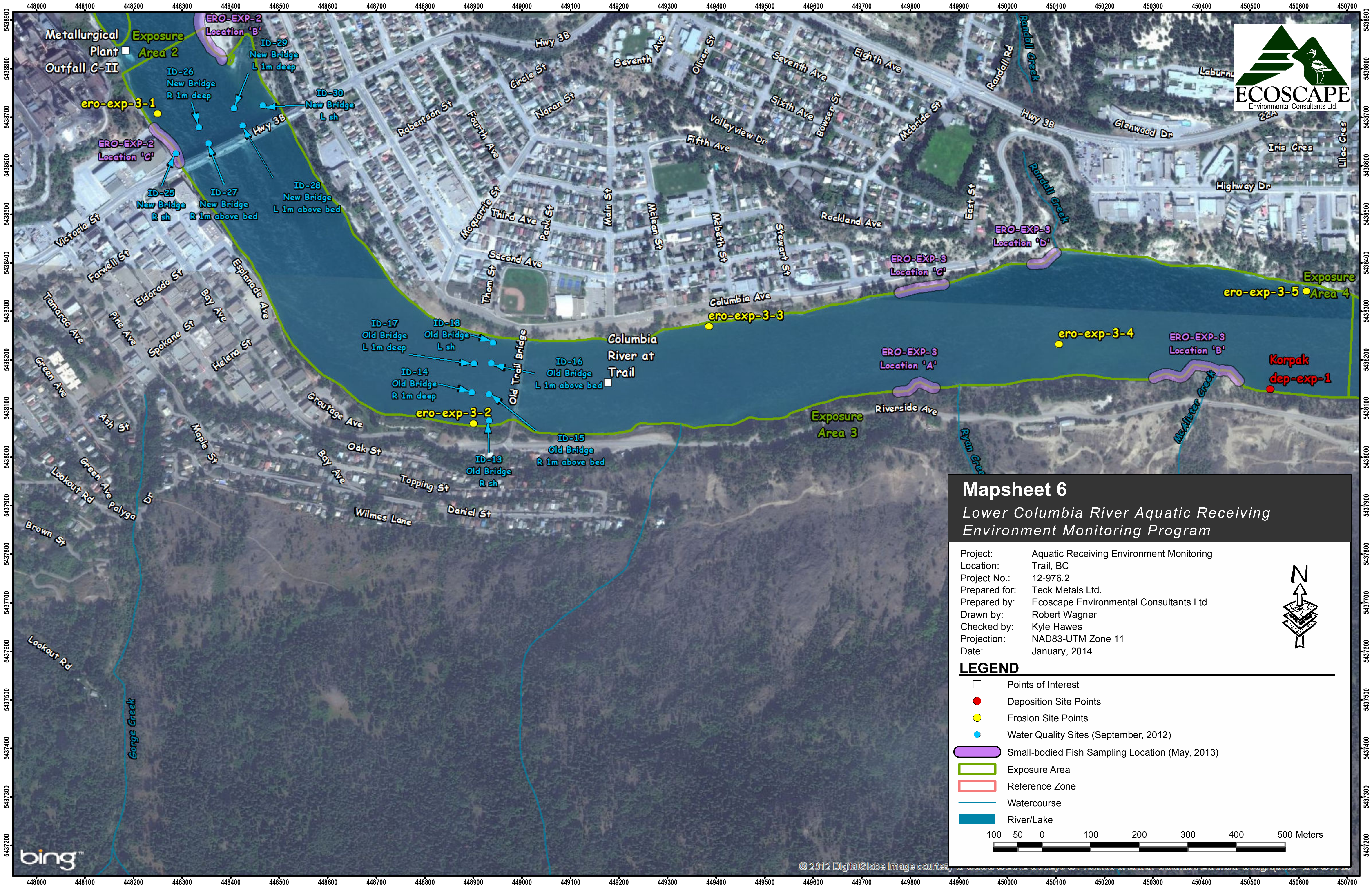

Mapsheet 6

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

N

LEGEND

□	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
▭	Exposure Area
▭	Reference Zone
—	Watercourse
▬	River/Lake

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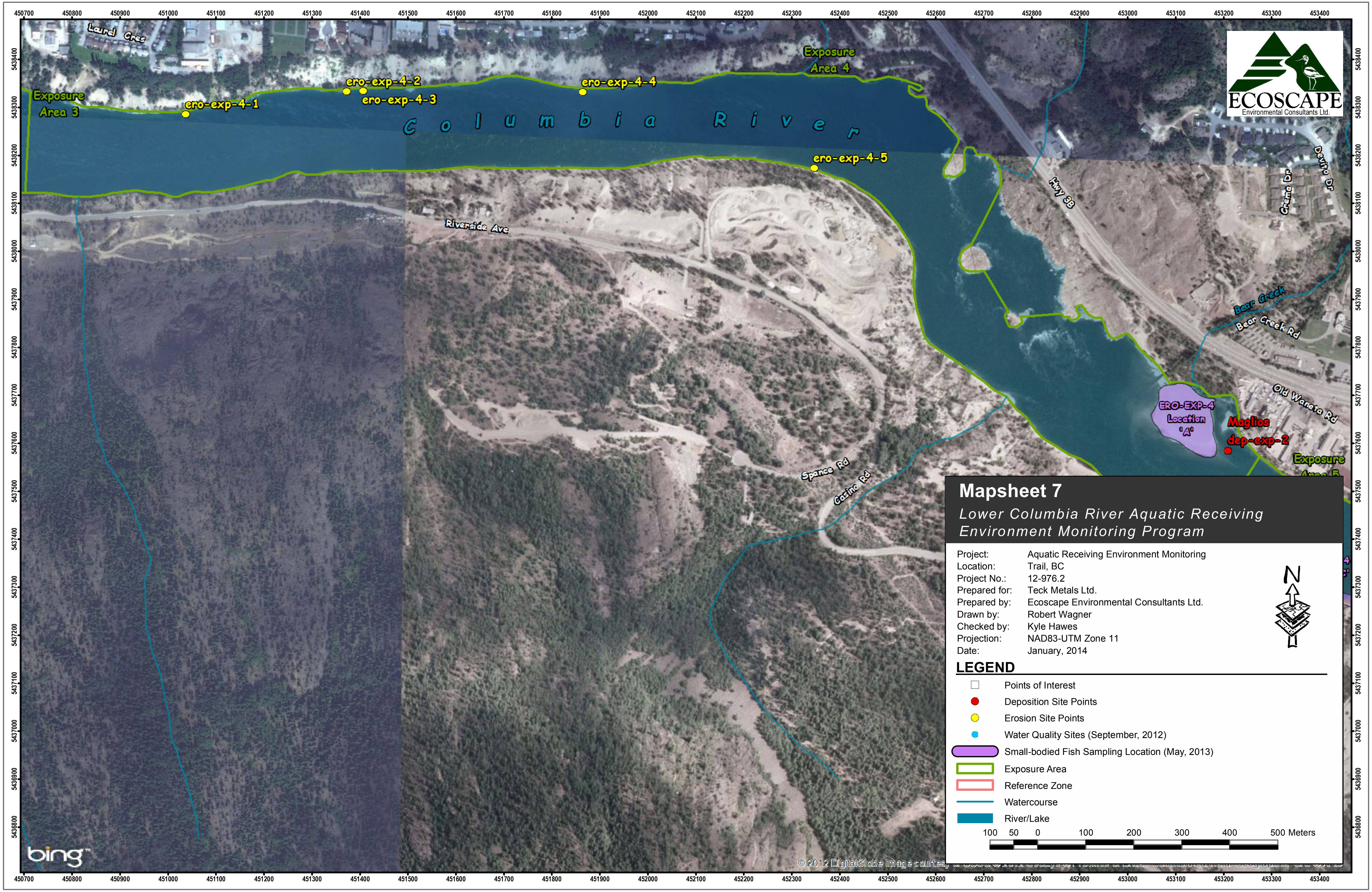


Mapsheet 7

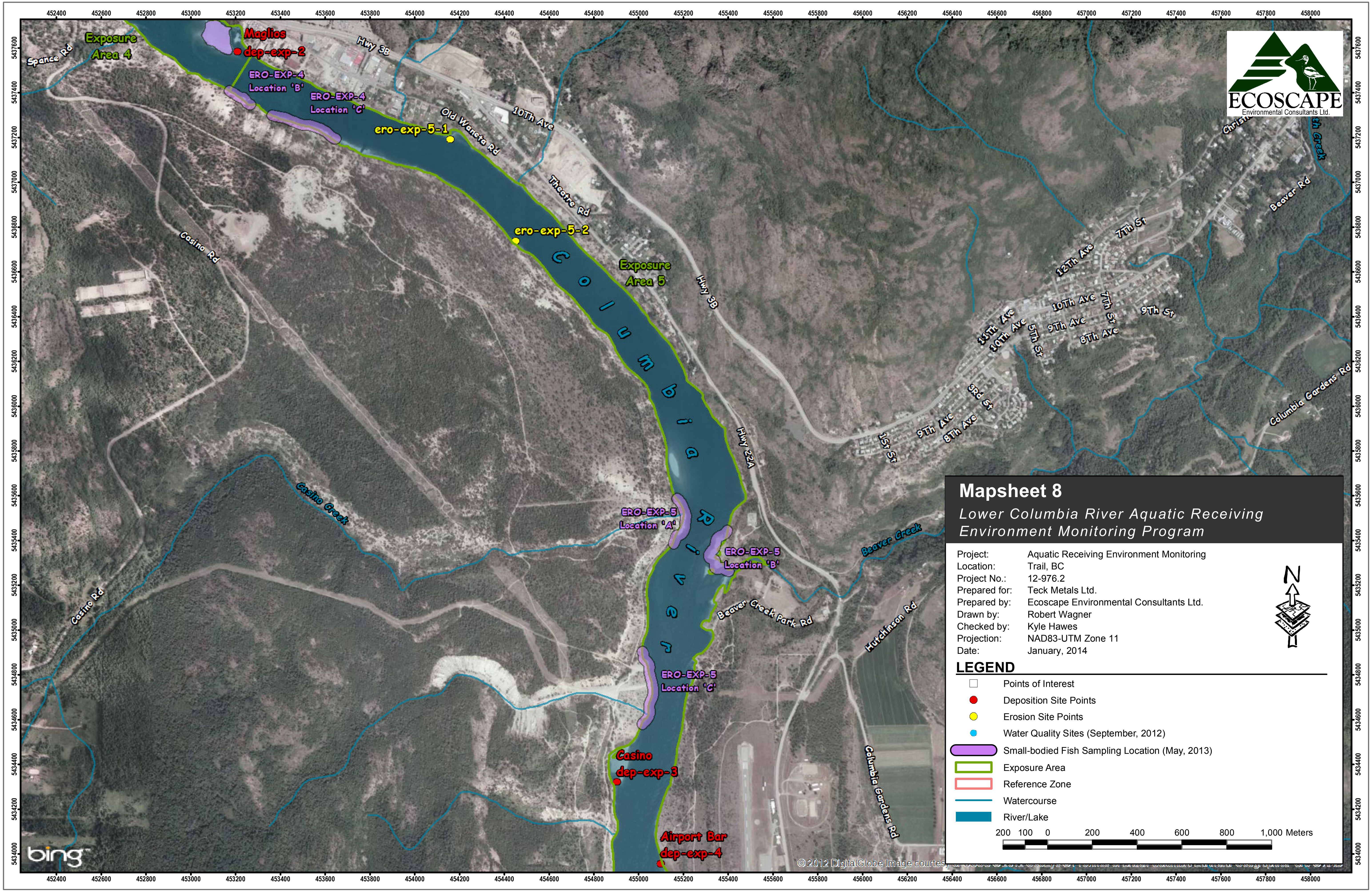
Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

☐	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
⬭	Small-bodied Fish Sampling Location (May, 2013)
▭	Exposure Area
▭	Reference Zone
—	Watercourse
▬	River/Lake

100 50 0 100 200 300 400 500 Meters



Mapsheet 8

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

☐	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
☐	Exposure Area
☐	Reference Zone
—	Watercourse
▬	River/Lake

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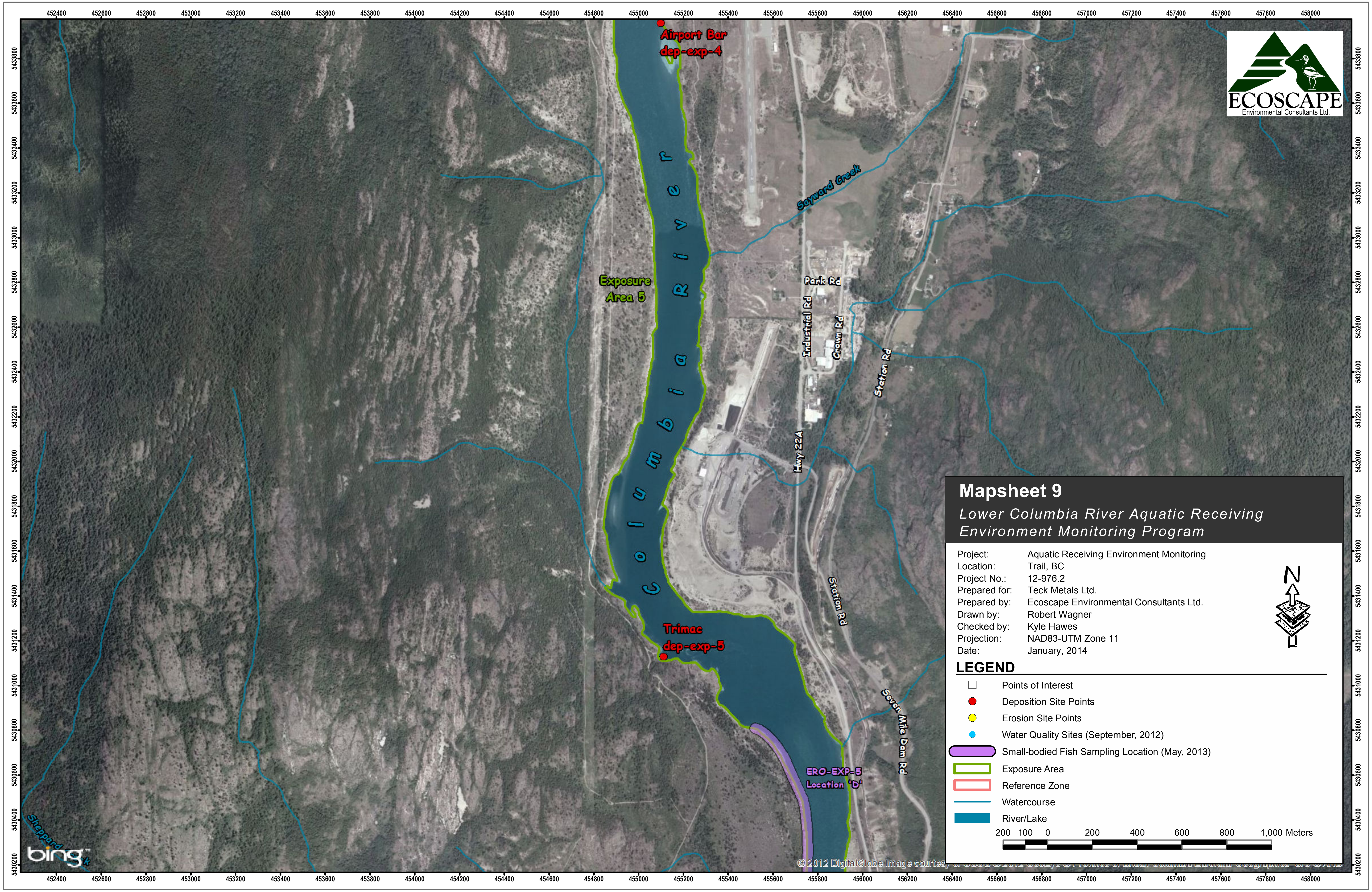


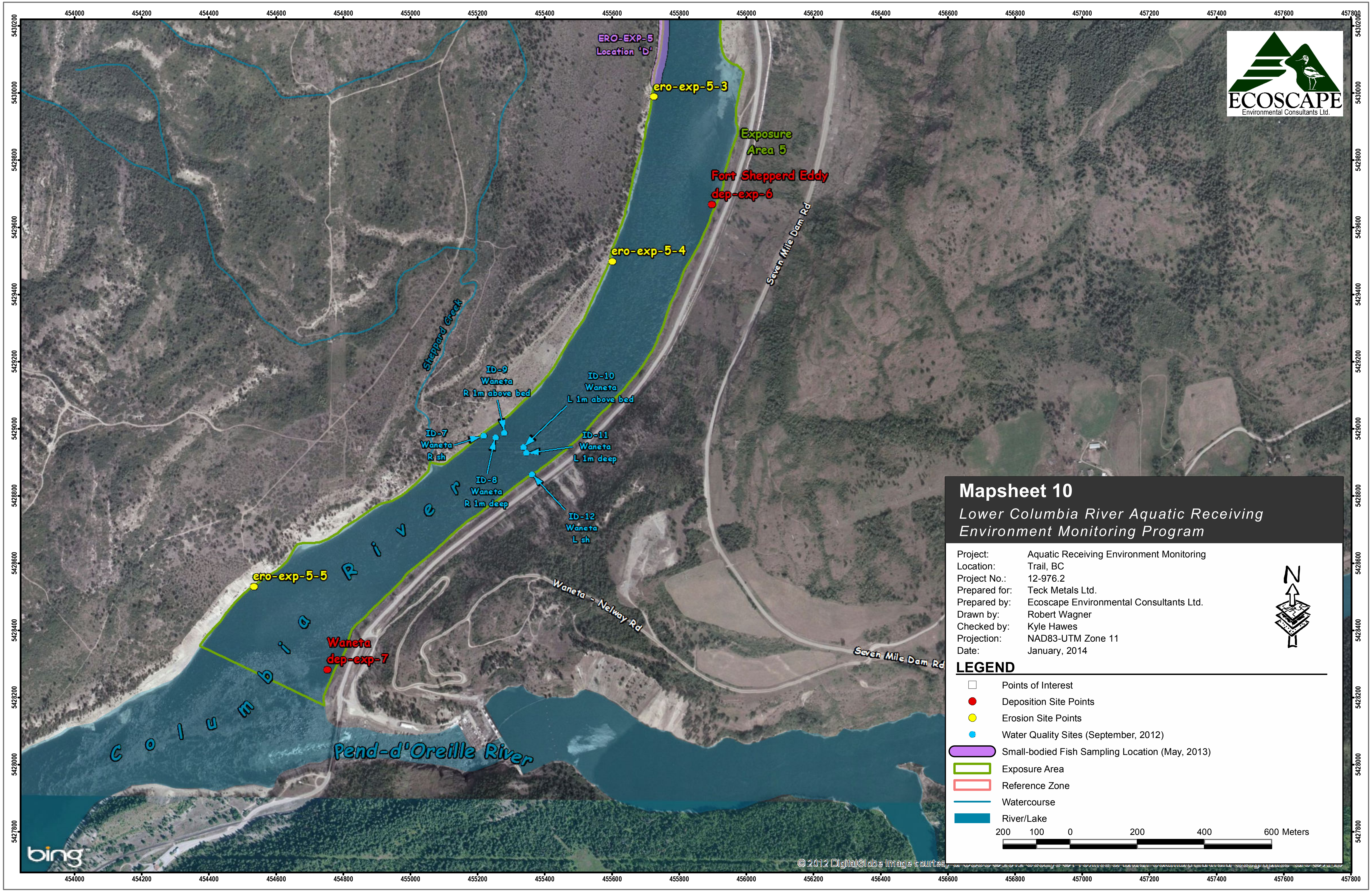
Mapsheet 9

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

LEGEND

☐	Points of Interest
●	Deposition Site Points
●	Erosion Site Points
●	Water Quality Sites (September, 2012)
▬	Small-bodied Fish Sampling Location (May, 2013)
▭	Exposure Area
▭	Reference Zone
—	Watercourse
■	River/Lake



Mapsheet 10

Lower Columbia River Aquatic Receiving Environment Monitoring Program

Project:	Aquatic Receiving Environment Monitoring
Location:	Trail, BC
Project No.:	12-976.2
Prepared for:	Teck Metals Ltd.
Prepared by:	Ecoscape Environmental Consultants Ltd.
Drawn by:	Robert Wagner
Checked by:	Kyle Hawes
Projection:	NAD83-UTM Zone 11
Date:	January, 2014

N

LEGEND

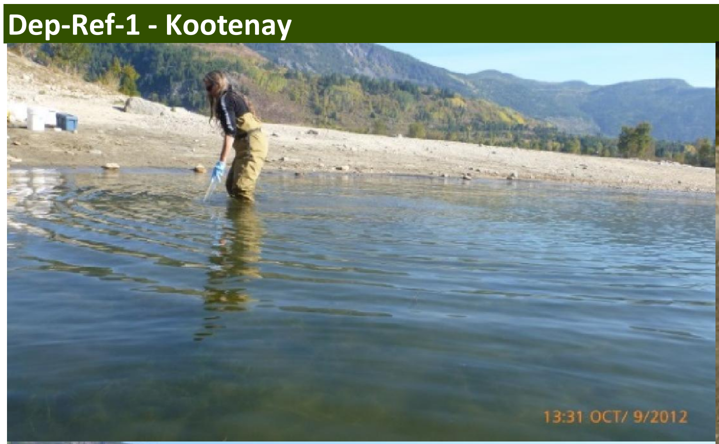
☐	Points of Interest
🔴	Deposition Site Points
🟡	Erosion Site Points
🔵	Water Quality Sites (September, 2012)
🟪	Small-bodied Fish Sampling Location (May, 2013)
🟩	Exposure Area
🟥	Reference Zone
—	Watercourse
🟦	River/Lake

200 100 0 200 400 600 Meters

APPENDIX A

SAMPLE SITES

Dep-Ref-1 - Kootenay



GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-ref-1-1	-26122	-27693	-28186	10/9/2012	12.0	low	Right Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
1	0	29	70	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.03	0.04	High (75%+)	Low	0.90	0.00

COMMENTS

Right bank of Kootenay river upstream of confluence with Columbia - sampled away from boat launch. Silty fine sand. Majority of sample passed through 500 micron seive.no current. Backwater eddy.

Dep-Ref-2 - Genelle

GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-ref-2-1	-10756	-12327	-12820	10/9/2012	12.0	low	Right Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
0	0	0	99	1	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.04	1.00	High (75%+)	Low	0.77	0.00

COMMENTS

Genelle - sand bar in lee of mainstem-beds of dense macrophyte sampled with 3minute sweep medium grained sand with minor gravel component no current. adjacent to dense macro bed of predominantly *Elodea canadensis*, with minor Potamogeton sp. and Myriophyllum sp.

Dep-Ref-3 - Birchbank

GENERAL

Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-ref-3-1	-6189	-7760	-8253	10/10/2012	13.0	low	Left Bank

SUBSTRATES

% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
0	0	0	100	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.06	0.08	High (75%+)	Low	0.40	0.10

COMMENTS

Birchbank - Medium to coarse sand -picked sample in field since sand too coarse to sieve. No inverts detected.sand depositional area

Dep-Exp-1 - Korpak

GENERAL							
Sample Name	**CIV Distance (m)**	**CIII Distance (m)**	**CII Distance (m)**	**Date**	**Water Temp**	**LCR Stage**	**River Bank (R/L)**
dep-exp-1-1	4802	4309	2738	10/13/2012	13.0	low	Right Bank

SUBSTRATES							
% Organic	**% Clay**	**% Silt**	**% Sand**	**% Gravel**	**% Cobble**	**% Boulder**	**% BedRock**
0	0	0	100	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.03	0.05	High (75%+)	Low	0.00	0.00

COMMENTS

Korpakfine to coarse sand

Dep-Exp-2 -Maglios

GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-exp-2-1	7662	7169	5598	10/13/2012	13.0	low	Left Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
0	0	0	100	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.02	High (75%+)	Low	0.40	0.00

COMMENTS

Magliosvery fine sand

Dep-Exp-3 - Casino

GENERAL

Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-exp-3-1	11974	11481	9910	10/13/2012	13.0	low	Right Bank

SUBSTRATES

% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
0	0	0	100	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.02	High (75%+)	Low	0.90	0.00

COMMENTS

Casinovery fine sandmussels visually noticeable at this site. collected for metals analysis

Dep-Exp-4 - Airport Bar

GENERAL							
Sample Name	**CIV Distance (m)**	**CIII Distance (m)**	**CII Distance (m)**	**Date**	**Water Temp**	**LCR Stage**	**River Bank (R/L)**
dep-exp-4-1	12338	11845	10274	10/13/2012	13.0	low	Left Bank

SUBSTRATES							
% Organic	**% Clay**	**% Silt**	**% Sand**	**% Gravel**	**% Cobble**	**% Boulder**	**% BedRock**
0	0	0	100	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.02	High (75%+)	Low	0.45	0.00

COMMENTS

Airport barvery fine sand

Dep-Exp-5-Trimac

GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-exp-5-1	15221	14728	13157	10/13/2012	13.0	low	Right Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
1	0	14	85	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.02	High (75%+)	Low	1.10	0.00

COMMENTS

Trimac site very fine sand

Dep-Exp-6- Ft. Sheppard Eddy


17:01 OCT/12/2012

GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-exp-6-1	17006	16513	14942	10/12/2012	13.0	low	Left Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
5	0	20	75	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.01	High (75%+)	Low	1.00	0.00

COMMENTS

Ft. Shepperd eddymacrophyte/milfoil and potamogeton-silty very fine sand

Dep-Exp-7-Waneta


16:04 OCT/12/2012


16:04 OCT/12/2012

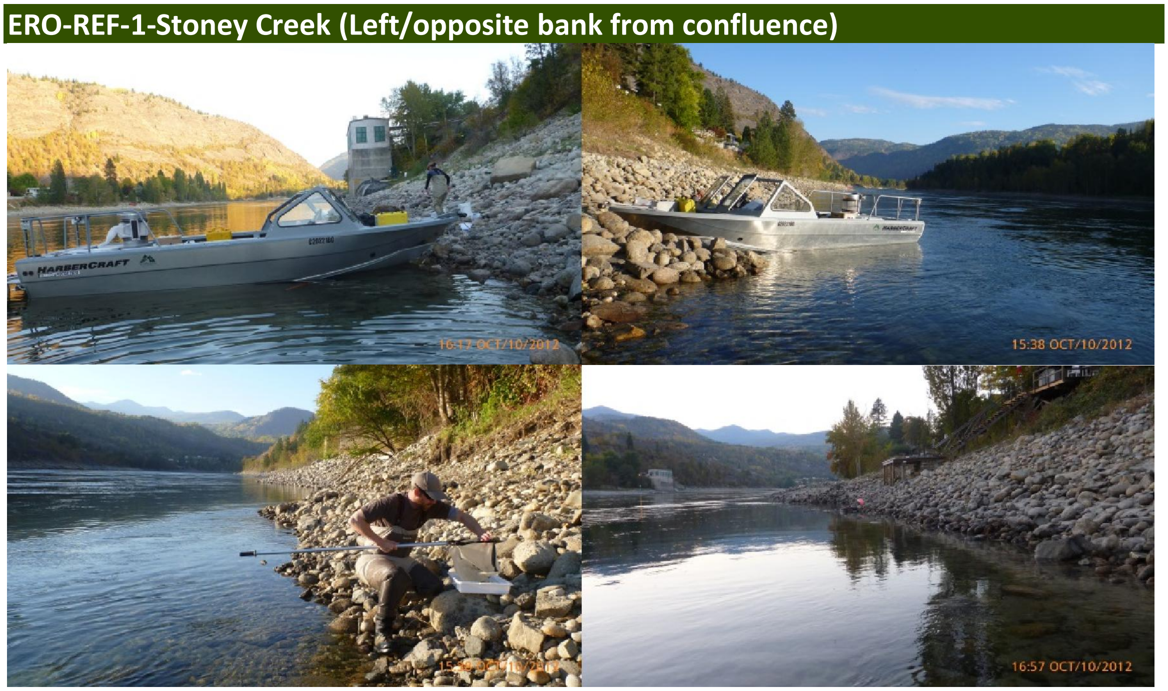
GENERAL							
Sample Name	CIV Distance (m)	CIII Distance (m)	CII Distance (m)	Date	Water Temp	LCR Stage	River Bank (R/L)
dep-exp-7-1	18814	18321	16750	10/12/2012	13.0	low	Left Bank

SUBSTRATES							
% Organic	% Clay	% Silt	% Sand	% Gravel	% Cobble	% Boulder	% BedRock
0	0	100	0	0	0	0	0

D50	D90	% Embeddedness	Compaction	Wetted Depth	Velocity (m/s)
0.01	0.01	Unknown	0.00	2.80	0.00

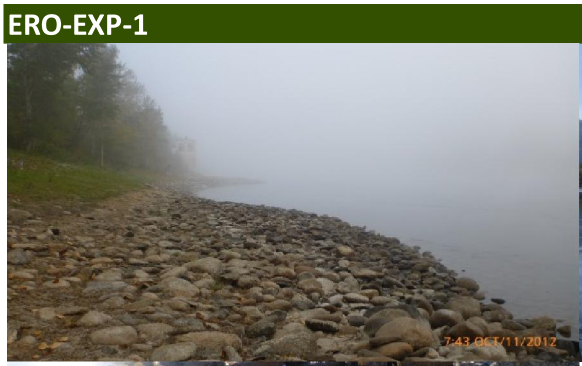
COMMENTS

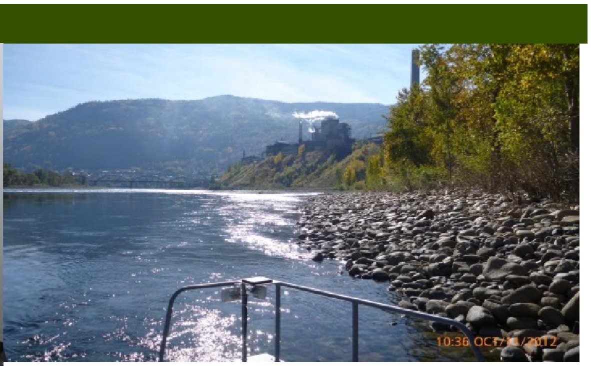
ERO-REF-1-Stoney Creek (Left/opposite bank from confluence)

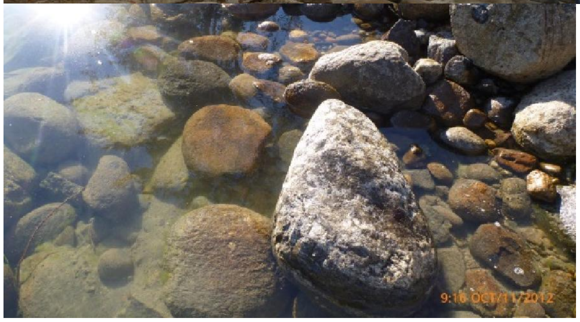


ERO-REF-2-Birchbank

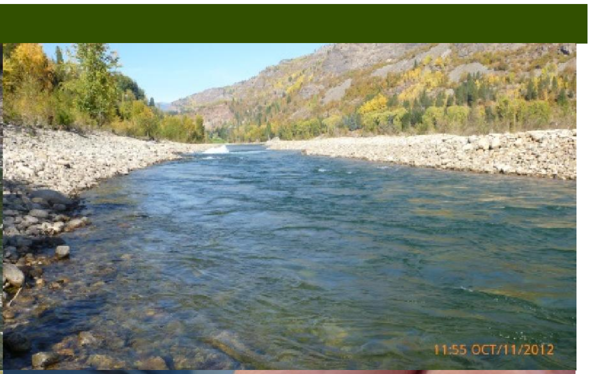
ERO-EXP-1







ERO-EXP-2



ERO-EXP-3

ERO-EXP-4

ERO-EXP-5

Appendix A. Erosional Sample Site Habitat Data

Sample Nam	SUB Sample	CIV Dist	CIII Dist	CII Dist	Sample Typ	Date	Air Temp	Water Temp	Stage	River Bank	Sub Organi	Sub Clay	Sub Silt	Sub Sand	Sub Gravel	Sub Cobble	Sub Blder	Sub BedRk	D50	D90	Embeddedne	Compaction	Depth_W	VEL_BOT	VEL40	VEL_SURF
ero-exp-1-1	1	199	-1372	-1865	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	5	10	35	50	0	20	40	Medium (25-75%)	High	0.32	0.04	0.14	0.15
ero-exp-1-1	2	199	-1372	-1865	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	5	10	35	50	0	20	40	Medium (25-75%)	High	0.32	0.04	0.14	0.15
ero-exp-1-1	3	199	-1372	-1865	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	5	10	35	50	0	20	40	None	High	0.32	0.04	0.14	0.15
ero-exp-1-1	4	199	-1372	-1865	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	2	8	25	65	0	25	40	None	High	0.35	0.02	0.12	0.24
ero-exp-1-1	5	199	-1372	-1865	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	2	8	25	65	0	25	40	None	High	0.35	0.01	0.16	0.18
ero-exp-1-2	1	294	-1277	-1770	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	50	None	High	0.40	0.00	0.08	0.11
ero-exp-1-2	2	294	-1277	-1770	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	50	None	High	0.39	0.00	0.03	0.08
ero-exp-1-2	3	294	-1277	-1770	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	50	None	High	0.35	0.01	0.17	0.28
ero-exp-1-2	4	294	-1277	-1770	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	50	None	High	0.35	0.00	0.04	0.13
ero-exp-1-2	5	294	-1277	-1770	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	50	None	High	0.40	0.00	0.01	0.03
ero-exp-1-3	1	857	-714	-1207	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	25	75	0	20	50	None	High	0.35	0.00	0.00	0.02
ero-exp-1-3	2	857	-714	-1207	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	35	50	None	High	0.35	0.00	0.00	0.05
ero-exp-1-3	3	857	-714	-1207	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	15	80	0	45	60	None	High	0.30	0.00	0.02	0.10
ero-exp-1-3	4	857	-714	-1207	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	1	4	20	75	0	25	45	None	High	0.30	0.00	0.02	0.10
ero-exp-1-3	5	857	-714	-1207	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	3	7	20	70	0	25	45	None	High	0.38	0.00	0.03	0.10
ero-exp-1-4	1	977	-594	-1087	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	20	20	40	20	0	10	35	Medium (25-75%)	High	0.30	0.00	0.10	0.06
ero-exp-1-4	2	977	-594	-1087	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	20	20	40	20	0	10	35	Medium (25-75%)	High	0.30	0.00	0.10	0.06
ero-exp-1-4	3	977	-594	-1087	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	20	20	40	20	0	10	35	Medium (25-75%)	High	0.30	0.00	0.00	0.01
ero-exp-1-4	4	977	-594	-1087	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	35	20	35	10	0	10	35	Medium (25-75%)	High	0.30	0.00	0.00	0.01
ero-exp-1-4	5	977	-594	-1087	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	15	30	35	20	0	15	40	Medium (25-75%)	High	0.25	0.00	0.00	0.01
ero-exp-1-5	1	1255	-316	-809	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	0	5	60	35	0	20	35	None	High	0.29	0.10	0.41	0.57
ero-exp-1-5	2	1255	-316	-809	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	0	5	60	35	0	20	35	None	High	0.39	0.06	0.38	0.41
ero-exp-1-5	3	1255	-316	-809	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	0	5	60	35	0	20	35	None	High	0.25	0.01	0.21	0.45
ero-exp-1-5	4	1255	-316	-809	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	0	5	75	20	0	20	35	None	High	0.22	0.09	0.16	0.20
ero-exp-1-5	5	1255	-316	-809	Surber/Kick	10/11/2012	7.0	12.0	low	Right	0	0	0	0	5	75	20	0	20	35	None	High	0.24	0.04	0.31	0.62
ero-exp-2-1	1	1635	64	-429	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	0	30	65	5	0	15	25	None	High	0.29	0.10	0.31	0.44
ero-exp-2-1	2	1635	64	-429	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	0	30	65	5	0	15	25	None	High	0.30	0.05	0.26	0.37
ero-exp-2-1	3	1635	64	-429	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	0	30	65	5	0	15	25	None	High	0.25	0.21	0.33	0.25
ero-exp-2-1	4	1635	64	-429	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	0	30	65	5	0	15	25	None	High	0.25	0.02	0.21	0.32
ero-exp-2-1	5	1635	64	-429	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	0	30	65	5	0	15	25	None	High	0.26	0.00	0.04	0.09
ero-exp-2-2	1	1698	127	-366	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	1	49	50	0	0	8	15	None	High	0.25	0.21	0.47	0.68
ero-exp-2-2	2	1698	127	-366	Surber/Kick	10/11/2012	7.0	13.9	low	Right	0	0	0	1	49	50	0	0	8	15	None	High	0.25	0.21	0.47	0.68
ero-exp-2-2	3	1698	127	-366	Surber/Kick	10/11/2012	7.0	13.9	low	Left	0	0	0	3	57	40	0	0	8	15	None	High	0.25	0.21	0.47	0.68
ero-exp-2-2	4	1698	127	-366	Surber/Kick	10/11/2012	7.0	13.9	low	Left	0	0	0	3	57	40	0	0	8	15	None	High	0.25	0.21	0.47	0.68
ero-exp-2-2	5	1698	127	-366	Surber/Kick	10/11/2012	7.0	13.9	low	Left	0	0	0	3	57	40	0	0	8	15	None	High	0.25	0.21	0.47	0.68
ero-exp-2-3	1	1731	160	-333	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	8	15	None	High	0.24	0.40	0.65	0.75
ero-exp-2-3	2	1731	160	-333	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	8	15	Low (0-25%)	High	0.24	0.22	0.57	0.72
ero-exp-2-3	3	1731	160	-333	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	8	15	Low (0-25%)	High	0.24	0.22	0.57	0.72
ero-exp-2-3	4	1731	160	-333	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	8	15	Low (0-25%)	High	0.24	0.14	0.62	0.68
ero-exp-2-3	5	1731	160	-333	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	8	15	Low (0-25%)	High	0.24	0.14	0.62	0.68
ero-exp-2-4	1	1868	297	-196	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	63	35	0	0	10	20	Low (0-25%)	High	0.20	0.00	0.07	0.40
ero-exp-2-4	2	1868	297	-196	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	60	33	5	0	10	20	Low (0-25%)	High	0.20	0.00	0.07	0.40
ero-exp-2-4	3	1868	297	-196	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	2	60	33	5	0	10	20	Low (0-25%)	High	0.20	0.00	0.07	0.40
ero-exp-2-4	4	1868	297	-196	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	5	60	30	5	0	10	20	Low (0-25%)	High	0.20	0.00	0.07	0.40
ero-exp-2-4	5	1868	297	-196	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	5	60	30	5	0	10	20	Low (0-25%)	High	0.20	0.00	0.07	0.40
ero-exp-2-5	1	1760	189	-304	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	40	49	10	0	20	40	Low (0-25%)	High	0.25	0.22	0.44	0.48
ero-exp-2-5	2	1760	189	-304	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	40	49	10	0	20	40	Low (0-25%)	High	0.25	0.22	0.44	0.48
ero-exp-2-5	3	1760	189	-304	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	40	49	10	0	20	40	Low (0-25%)	High	0.25	0.22	0.44	0.48
ero-exp-2-5	4	1760	189	-304	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	40	49	10	0	20	40	Low (0-25%)	High	0.25	0.22	0.44	0.48
ero-exp-2-5	5	1760	189	-304	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	19	75	5	0	15	25	Low (0-25%)	High	0.25	0.08	0.27	0.32
ero-exp-3-1	1	2201	630	137	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	24	70	5	0	20	30	Medium (25-75%)	High	0.35	0.16	0.16	0.23
ero-exp-3-1	2	2201	630	137	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	24	70	5	0	20	30	Medium (25-75%)	High	0.30	0.16	0.16	0.23
ero-exp-3-1	3	2201	630	137	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	24	70	5	0	20	30	High (75%+)	High	0.30	0.16	0.16	0.23
ero-exp-3-1	4	2201	630	137	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	24	70	5	0	20	30	High (75%+)	High	0.25	0.19	0.31	0.35
ero-exp-3-1	5	2201	630	137	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	1	24	70	5	0	20	30	High (75%+)	High	0.25	0.22	0.41	0.43
ero-exp-3-2	1	3131	1560	1067	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	5	25	65	5	0	15	40	Medium (25-75%)	High	0.27	0.00	0.00	0.07
ero-exp-3-2	2	3131	1560	1067	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	5	25	65	5	0	15	40	Medium (25-75%)	High	0.27	0.00	0.00	0.07
ero-exp-3-2	3	3131	1560	1067	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	5	25	65	5	0	15	40	Medium (25-75%)	High	0.27	0.00	0.00	0.07
ero-exp-3-2	4	3131	1560	1067	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	5	25	65	5	0	15	40	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-3-2	5	3131	1560	1067	Surber/Kick	10/11/2012	18.0	13.9	low	Right	0	0	0	5	25	65	5	0	15	40	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-3-3	1	3624	2053	1560	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	1	25	65	9	0	15	40	None	High	0.25	0.14	0.24	0.24
ero-exp-3-3	2	3624	2053	1560	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	1	25	65	9	0	15	40	None	High	0.25	0.14	0.24	0.24
ero-exp-3-3	3	3624	2053	1560	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	1	25	65	9	0	15	40	None	High	0.25	0.14	0.24	0.24
ero-exp-3-3	4	3624	2053	1560	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	1	25	65	9	0	15	40	None	High	0.25	0.14	0.24	0.24

ero-exp-3-3	5	3624	2053	1560	Surber/Kick	10/11/2012	18.0	13.9	low	Left	0	0	0	1	25	65	9	0	15	40	None	High	0.25	0.14	0.24	0.24
ero-exp-3-4	1	4339	2768	2275	Surber/Kick	10/12/2012	6.0	13.0	low	Right	0	0	0	0	5	70	25	0	20	40	None	High	35.00	0.27	0.41	0.66
ero-exp-3-4	2	4339	2768	2275	Surber/Kick	10/12/2012	6.0	13.0	low	Right	0	0	0	0	5	70	25	0	20	40	None	High	35.00	0.27	0.41	0.66
ero-exp-3-4	3	4339	2768	2275	Surber/Kick	10/12/2012	6.0	13.0	low	Right	0	0	0	0	5	70	25	0	20	40	None	High	35.00	0.27	0.41	0.66
ero-exp-3-4	4	4339	2768	2275	Surber/Kick	10/12/2012	6.0	13.0	low	Right	0	0	0	0	1	74	25	0	25	40	None	High	35.00	0.22	0.61	0.74
ero-exp-3-4	5	4339	2768	2275	Surber/Kick	10/12/2012	6.0	13.0	low	Right	0	0	0	0	1	74	25	0	25	40	None	High	0.20	0.19	0.54	0.60
ero-exp-3-5	1	4864	3293	2800	Surber/Kick	10/12/2012	6.0	13.0	low	Left	0	0	0	0	2	73	25	0	25	55	None	High	0.25	0.02	0.17	0.19
ero-exp-3-5	2	4864	3293	2800	Surber/Kick	10/12/2012	6.0	13.0	low	Left	0	0	0	0	2	73	25	0	25	35	None	High	0.25	0.11	0.19	0.28
ero-exp-3-5	3	4864	3293	2800	Surber/Kick	10/12/2012	6.0	13.0	low	Left	0	0	0	0	2	73	25	0	20	30	None	High	0.25	0.11	0.19	0.28
ero-exp-3-5	4	4864	3293	2800	Surber/Kick	10/12/2012	6.0	13.0	low	Left	0	0	0	0	2	73	25	0	20	30	None	High	0.25	0.11	0.16	0.22
ero-exp-3-5	5	4864	3293	2800	Surber/Kick	10/12/2012	6.0	13.0	low	Left	0	0	0	1	5	85	9	0	20	30	None	High	0.25	0.00	0.01	0.08
ero-exp-4-1	1	5274	3703	3210	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	30	35	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.01	0.02
ero-exp-4-1	2	5274	3703	3210	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	30	35	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.01	0.02
ero-exp-4-1	3	5274	3703	3210	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	30	35	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.01	0.02
ero-exp-4-1	4	5274	3703	3210	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	30	35	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.01	0.02
ero-exp-4-1	5	5274	3703	3210	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	35	30	30	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.01	0.02
ero-exp-4-2	1	5612	4041	3548	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	35	30	30	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.00	0.01
ero-exp-4-2	2	5612	4041	3548	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	35	30	30	5	0	5	20	High (75%+)	Medium	0.25	0.00	0.00	0.01
ero-exp-4-2	3	5612	4041	3548	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	25	45	25	5	0	5	15	High (75%+)	Medium	0.25	0.00	0.00	0.01
ero-exp-4-2	4	5612	4041	3548	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	45	25	0	0	5	20	High (75%+)	Medium	0.25	0.00	0.00	0.01
ero-exp-4-2	5	5612	4041	3548	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	30	45	25	0	0	5	20	High (75%+)	Medium	0.25	0.00	0.00	0.01
ero-exp-4-3	1	5646	4075	3582	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	40	30	25	5	0	10	25	High (75%+)	Medium	0.25	0.10	0.17	0.24
ero-exp-4-3	2	5646	4075	3582	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	40	30	25	5	0	10	25	High (75%+)	Medium	0.25	0.10	0.17	0.24
ero-exp-4-3	3	5646	4075	3582	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	40	30	25	5	0	10	25	High (75%+)	Medium	0.25	0.10	0.17	0.24
ero-exp-4-3	4	5646	4075	3582	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	40	30	25	5	0	10	25	High (75%+)	Medium	0.25	0.10	0.17	0.24
ero-exp-4-3	5	5646	4075	3582	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	40	30	25	5	0	10	25	High (75%+)	Medium	0.25	0.10	0.17	0.24
ero-exp-4-4	1	6104	4533	4040	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	5	20	50	25	0	20	50	Medium (25-75%)	Medium	0.28	0.01	0.11	0.17
ero-exp-4-4	2	6104	4533	4040	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	2	8	50	40	0	20	50	Medium (25-75%)	Medium	0.28	0.01	0.11	0.17
ero-exp-4-4	3	6104	4533	4040	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	1	10	69	20	0	15	45	Low (0-25%)	Medium	0.28	0.01	0.11	0.17
ero-exp-4-4	4	6104	4533	4040	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	1	10	79	10	0	15	35	Low (0-25%)	Medium	0.28	0.01	0.24	0.31
ero-exp-4-4	5	6104	4533	4040	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	2	5	28	65	0	15	40	Low (0-25%)	Medium	0.28	0.01	0.24	0.31
ero-exp-4-5	1	6614	5043	4550	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	10	20	65	5	0	15	25	Medium (25-75%)	Medium	0.25	0.00	0.00	0.00
ero-exp-4-5	2	6614	5043	4550	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	10	20	65	5	0	15	25	Medium (25-75%)	Medium	0.25	0.00	0.00	0.00
ero-exp-4-5	3	6614	5043	4550	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	10	20	65	5	0	15	25	Medium (25-75%)	Medium	0.25	0.00	0.00	0.00
ero-exp-4-5	4	6614	5043	4550	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	10	20	65	5	0	15	25	Medium (25-75%)	Medium	0.25	0.00	0.00	0.00
ero-exp-4-5	5	6614	5043	4550	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	10	20	65	5	0	15	25	Medium (25-75%)	Medium	0.25	0.00	0.00	0.00
ero-exp-5-1	1	8737	7166	6673	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	5	8	87	0	0	15	25	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-5-1	2	8737	7166	6673	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	5	8	87	0	0	15	25	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-5-1	3	8737	7166	6673	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	4	1	95	0	0	25	30	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-5-1	4	8737	7166	6673	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	4	1	95	0	0	25	30	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-5-1	5	8737	7166	6673	Surber/Kick	10/12/2012	8.0	13.0	low	Left	0	0	0	4	1	95	0	0	25	30	Medium (25-75%)	High	0.27	0.00	0.00	0.00
ero-exp-5-2	1	9199	7628	7135	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	High (75%+)	High	0.25	0.14	0.21	0.31
ero-exp-5-2	2	9199	7628	7135	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	Medium (25-75%)	High	0.25	0.17	0.27	0.38
ero-exp-5-2	3	9199	7628	7135	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	Medium (25-75%)	High	0.25	0.17	0.27	0.38
ero-exp-5-2	4	9199	7628	7135	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	Medium (25-75%)	High	0.25	0.17	0.27	0.38
ero-exp-5-2	5	9199	7628	7135	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	Medium (25-75%)	High	0.25	0.17	0.27	0.38
ero-exp-5-3	1	16697	15126	14633	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	None	High	0.25	0.22	0.56	0.74
ero-exp-5-3	2	16697	15126	14633	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	None	High	0.25	0.22	0.56	0.74
ero-exp-5-3	3	16697	15126	14633	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	29	60	10	0	20	30	None	High	0.25	0.22	0.56	0.74
ero-exp-5-3	4	16697	15126	14633	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	19	70	10	0	20	30	None	High	0.25	0.22	0.56	0.74
ero-exp-5-3	5	16697	15126	14633	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	1	19	70	10	0	20	30	None	High	0.25	0.22	0.56	0.74
ero-exp-5-4	1	17249	15678	15185	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	10	90	0	0	15	25	None	High	0.30	0.06	0.35	0.49
ero-exp-5-4	2	17249	15678	15185	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	10	90	0	0	15	25	None	High	0.30	0.06	0.35	0.49
ero-exp-5-4	3	17249	15678	15185	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	10	90	0	0	15	25	None	High	0.30	0.06	0.35	0.49
ero-exp-5-4	4	17249	15678	15185	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	10	90	0	0	15	25	None	High	0.30	0.06	0.35	0.49
ero-exp-5-4	5	17249	15678	15185	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	10	90	0	0	15	25	None	High	0.30	0.06	0.35	0.49
ero-exp-5-5	1	18749	17178	16685	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	20	80	0	0	15	25	None	High	0.28	0.04	0.17	0.28
ero-exp-5-5	2	18749	17178	16685	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	20	80	0	0	15	25	None	High	0.28	0.04	0.17	0.28
ero-exp-5-5	3	18749	17178	16685	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	20	80	0	0	15	25	None	High	0.28	0.04	0.17	0.28
ero-exp-5-5	4	18749	17178	16685	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	20	80	0	0	15	25	None	High	0.28	0.04	0.17	0.28
ero-exp-5-5	5	18749	17178	16685	Surber/Kick	10/12/2012	8.0	13.0	low	Right	0	0	0	0	20	80	0	0	15	25	None	High	0.28	0.04	0.17	0.28
ero-ref-1-1	1	-158	-1751	-2167	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.35	0.01	0.03	0.04
ero-ref-1-1	2	-158	-1751	-2167	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	35	45	10	0	5	15	Medium (25-75%)	High	0.35	0.01	0.03	0.04
ero-ref-1-1	3	-158	-1751	-2167	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	35	45	10	0	5	15	Medium (25-75%)	High	0.35	0.01	0.03	0.04
ero-ref-1-1	4	-158	-1751	-2167	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	35	45	10	0	5	15	Medium (25-75%)	High	0.35	0.05	0.15	0.20
ero-ref-1-1	5	-158	-1751	-2167	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	40	45	5	0	5	15	Medium (25-75%)	High	0.32	0.40	0.22	0.25
ero-ref-1-2	1	-180	-1889	-2293	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	10	40	45	5	0	7	20	Medium (25-75%)	High	0.32	0.00	0.00	0.00

ero-ref-1-2	2	-180	-1889	-2293	Other	10/10/2012	12.0	13.0	low	Left	0	0	0	15	40	40	5	0	7	20	Medium (25-75%)	High	0.32	0.00	0.00	0.00
ero-ref-1-2	3	-180	-1889	-2293	Other	10/10/2012	10.0	13.0	low	Right	0	0	0	15	40	35	10	0	7	25	Medium (25-75%)	High	0.32	0.00	0.00	0.00
ero-ref-1-2	4	-180	-1889	-2293	Other	10/10/2012	10.0	13.0	low	Right	0	0	0	15	40	35	10	0	7	25	Medium (25-75%)	High	0.25	0.00	0.00	0.00
ero-ref-1-2	5	-180	-1889	-2293	Other	10/10/2012	10.0	13.0	low	Right	0	0	0	15	40	35	10	0	7	25	Medium (25-75%)	High	0.25	0.00	0.00	0.00
ero-ref-1-3	1	367	-1349	-1765	Other	10/10/2012	10.0	13.0	low	Right	0	0	0	10	15	50	25	0	10	35	Medium (25-75%)	High	0.30	0.02	0.15	0.18
ero-ref-1-3	2	367	-1349	-1765	Other	10/10/2012	10.0	13.0	low	Right	0	0	0	15	10	50	25	0	10	35	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-1-3	3	367	-1349	-1765	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	15	10	50	25	0	10	35	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-1-3	4	367	-1349	-1765	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	15	10	45	30	0	10	35	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-1-3	5	367	-1349	-1765	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	15	10	45	30	0	10	35	Medium (25-75%)	High	0.30	0.00	0.03	0.07
ero-ref-1-4	1	502	-1209	-1614	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	5	10	50	35	0	15	35	Medium (25-75%)	High	0.30	0.04	0.18	0.20
ero-ref-1-4	2	502	-1209	-1614	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	5	10	50	35	0	15	35	Medium (25-75%)	High	0.30	0.04	0.18	0.20
ero-ref-1-4	3	502	-1209	-1614	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	5	10	50	35	0	15	35	Medium (25-75%)	High	0.30	0.04	0.18	0.20
ero-ref-1-4	4	502	-1209	-1614	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	5	10	50	35	0	15	35	Medium (25-75%)	High	0.30	0.04	0.18	0.20
ero-ref-1-4	5	502	-1209	-1614	Other	10/10/2012	10.0	13.0	low	Left	0	0	0	5	10	50	35	0	15	35	Medium (25-75%)	High	0.30	0.01	0.11	0.12
ero-ref-1-5	1	756	-949	-1404	Other	10/11/2012	7.0	12.0	low	Left	0	0	0	1	4	60	35	0	15	35	Medium (25-75%)		0.25	0.03	0.12	0.15
ero-ref-1-5	2	756	-949	-1404	Other	10/11/2012	7.0	12.0	low	Left	0	0	0	1	4	60	35	0	15	35	Medium (25-75%)		0.32	0.03	0.12	0.15
ero-ref-1-5	3	756	-949	-1404	Other	10/11/2012	7.0	12.0	low	Left	0	0	0	10	10	50	30	0	15	40	Medium (25-75%)	High	0.31	0.03	0.12	0.15
ero-ref-1-5	4	756	-949	-1404	Other	10/11/2012	7.0	12.0	low	Left	0	0	0	10	10	35	45	0	20	40	Medium (25-75%)	High	0.31	0.03	0.12	0.15
ero-ref-1-5	5	756	-949	-1404	Other	10/11/2012	7.0	12.0	low	Left	0	0	0	10	5	20	65	0	20	40	Medium (25-75%)	High	0.28	0.01	0.08	0.11
ero-ref-2-1	1	-7207	-8778	-9271	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	20	30	Unknown		0.56	0.46	0.78	1.05
ero-ref-2-1	2	-7207	-8778	-9271		10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	20	30	Unknown		0.35	0.32	0.80	0.85
ero-ref-2-1	3	-7207	-8778	-9271	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	20	30	Unknown		0.37	0.24	0.38	0.61
ero-ref-2-1	4	-7207	-8778	-9271	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	20	30	Unknown		0.33	0.10	0.28	0.32
ero-ref-2-1	5	-7207	-8778	-9271	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	20	30	Unknown		0.40	0.14	0.42	0.51
ero-ref-2-2	1	-6932	-8503	-8996	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	15	25	Unknown		0.22	0.22	0.79	0.80
ero-ref-2-2	2	-6932	-8503	-8996	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	10	25	Low (0-25%)	High	0.35	0.07	0.62	0.47
ero-ref-2-2	3	-6932	-8503	-8996	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	10	25	Low (0-25%)	High	0.30	0.06	0.27	0.33
ero-ref-2-2	4	-6932	-8503	-8996	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	10	25	Low (0-25%)	High	0.25	0.14	0.35	0.64
ero-ref-2-2	5	-6932	-8503	-8996	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	1	2	97	0	0	10	25	Low (0-25%)	High	0.38	0.21	0.90	0.86
ero-ref-2-3	1	-6895	-8466	-8959	Surber/Kick	10/10/2012	12.0	13.0	low	Left	0	0	0	1	19	80	0	0	7	15	Low (0-25%)	High	0.40	0.25	0.46	0.46
ero-ref-2-3	2	-6895	-8466	-8959	Surber/Kick	10/10/2012	12.0	13.0	low	Left	0	0	0	1	19	80	0	0	7	15	Low (0-25%)	High	0.45	0.28	0.53	0.48
ero-ref-2-3	3	-6895	-8466	-8959	Surber/Kick	10/10/2012	12.0	13.0	low	Left	0	0	0	1	19	80	0	0	7	15	Low (0-25%)	High	0.38	0.22	0.49	0.56
ero-ref-2-3	4	-6895	-8466	-8959	Surber/Kick	10/10/2012	12.0	13.0	low	Left	0	0	0	1	19	80	0	0	7	15	Low (0-25%)	High	0.40	0.22	0.49	0.54
ero-ref-2-3	5	-6895	-8466	-8959	Surber/Kick	10/10/2012	12.0	13.0	low	Left	0	0	0	1	19	80	0	0	7	15	Low (0-25%)	High	0.35	0.24	0.49	0.52
ero-ref-2-4	1	-6733	-8304	-8797	Surber/Kick	10/10/2012	12.0	13.0	low	Right	0	0	0	10	15	75	0	0	7	12	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-2-4	2	-6733	-8304	-8797	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	15	75	0	0	7	12	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-2-4	3	-6733	-8304	-8797	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	15	75	0	0	7	12	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-2-4	4	-6733	-8304	-8797	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	15	75	0	0	10	15	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-2-4	5	-6733	-8304	-8797	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	15	75	0	0	10	15	Medium (25-75%)	High	0.30	0.00	0.00	0.00
ero-ref-2-5	1	-6404	-7975	-8468	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.40	0.00	0.05	0.05
ero-ref-2-5	2	-6404	-7975	-8468	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.45	0.00	0.05	0.05
ero-ref-2-5	3	-6404	-7975	-8468	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.40	0.00	0.05	0.05
ero-ref-2-5	4	-6404	-7975	-8468	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.40	0.02	0.06	0.08
ero-ref-2-5	5	-6404	-7975	-8468	Other	10/10/2012	12.0	13.0	low	Right	0	0	0	10	35	55	0	0	5	15	Medium (25-75%)	High	0.40	0.02	0.06	0.08

APPENDIX B

WATER QUALITY DATA

Sample ID	BB-G-R-9APR11	SC-G-R-9APR11	NB-G-R-9APR11	OB-G-R-9APR11	WS-G-L-9APR11	BB-G-R-15 APR 11	SC-G-R-15 APR 11	NB-G-R-15 APR 11	OB-G-R-15 APR 11	WS-G-R-15 APR 11	BB-T1-27 APR 11
Site	**bb**	**sc**	**nb**	**ob**	**wa**	**bb**	**sc**	**nb**	**ob**	**wa**	**bb**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**-9720**	**-1975**	**230**	**1090**	**15800**	**-9720**	**-1975**	**230**	**1090**	**15800**	**-9720**
Date Sampled	09-APR-11	09-APR-11	09-APR-11	09-APR-11	09-APR-11	15-APR-11	15-APR-11	15-APR-11	15-APR-11	15-APR-11	27-APR-11
Time Sampled	12:30	13:39	14:15	14:35	15:15	10:45	11:30	11:45	12:00	12:30	10:00
ALS Sample ID	L993765-1	L993765-2	L993765-3	L993765-4	L993765-5	L995885-1	L995885-2	L995885-3	L995885-4	L995885-5	L999052-1
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests											
Conductivity	148	146	150	147	148	146	145	151	146	147	140
Hardness (as CaCO3)	73.4	72.8	73.6	72.7	72.8	72.2	71.8	73.1	72.3	72.5	71.5
pH	8.09	8.06	8.06	8.06	8.08	8.07	8.08	8.07	8.11	8.12	7.93
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	83	87	84	86	86	85	75	83	86	88	86
Turbidity	0.36	0.32	0.40	0.37	0.40	0.63	0.45	0.70	0.74	0.64	0.42
Anions and Nutrients											
Alkalinity, Total (as CaCO3)	63.5	62.4	62.7	62.8	62.6	62.5	61.8	62.6	62.3	62.6	61.4
Ammonia, Total (as N)	<0.0050	<0.0050	0.0142	0.0094	0.0460	<0.0050	<0.0050	0.0193	0.0065	<0.0050	<0.0050
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.92	0.95	0.98	0.95	1.02	0.88	0.95	1.01	0.92	1.04	0.81
Fluoride (F)	0.053	0.065	0.078	0.068	0.068	0.056	0.058	0.080	0.061	0.061	0.059
Nitrate (as N)	0.132	0.132	0.134	0.131	0.133	0.126	0.132	0.133	0.128	0.130	0.123
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen											
Phosphorus (P)-Total Dissolved	<0.0020	0.0026	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0028	0.0032	0.0035	0.0041	0.0040	0.0034	0.0032	0.0032	0.0039	0.0060	0.0038
Sulfate (SO4)	11.7	11.9	13.1	12.2	12.2	11.7	11.8	14.2	12.3	12.3	11.4
Total Metals											
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Total Metals (Undigested)											
Aluminum (Al)-Total	0.0133	0.0215	0.0139	0.0139	0.0194	0.0102	0.0180	0.0131	0.0139	0.0238	0.0108
Antimony (Sb)-Total	<0.00050	<0.00050	0.00070	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050
Barium (Ba)-Total	0.024	0.025	0.024	0.025	0.024	0.023	0.024	0.023	0.024	0.024	0.023
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Total	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Total	0.000011	0.000023	**0.000082**	0.000031	0.000031	0.000012	0.000026	**0.000079**	**0.000050**	0.000044	0.000011
Calcium (Ca)-Total	21.6	22.1	22.0	22.4	22.1	21.1	21.2	21.3	21.5	21.8	20.7
Chromium (Cr)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Total	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead (Pb)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00109	<0.00050
Lithium (Li)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Total	5.18	5.26	5.13	5.25	5.10	5.14	5.15	5.06	5.12	5.17	4.98
Manganese (Mn)-Total	0.00150	0.00167	0.00255	0.00198	0.00211	0.00143	0.00161	0.00219	0.00195	0.00278	0.00152
Molybdenum (Mo)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Total	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silicon (Si)-Total	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total	<2.0	<2.0	2.2	<2.0	<2.0	<2.0	<2.0	2.5	2.2	2.2	<2.0
Strontium (Sr)-Total	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Total	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	0.00059	0.00056	0.00055	0.00058	0.00058	0.00054	0.00054	0.00055	0.00056	0.00057	0.00052
Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Metals Filtration Location											
Aluminum (Al)-Dissolved	0.0072	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00149	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00082	<0.00050	<0.00050	<0.00050
Barium (Ba)-Dissolved	0.023	0.023	0.023	0.023	0.022	0.023	0.022	0.022	0.022	0.022	0.022
Beryllium (Be)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Dissolved	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Dissolved	<0.000010	0.000022	0.000045	0.000025	0.000023	<0.000010	0.000022	0.000155	0.000047	0.000034	<0.000010
Calcium (Ca)-Dissolved	21.1	21.0	21.3	21.0	21.2	20.7	20.6	21.2	20.8	20.9	20.6
Chromium (Cr)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead (Pb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved	5.01	4.95	4.96	4.91	4.84	4.95	4.95	4.93	4.91	4.93	4.88
Manganese (Mn)-Dissolved	0.00040	0.00058	0.00105	0.00069	0.00082	<0.00030	0.00048	0.00165	0.00073	0.00065	0.00051
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010
Silicon (Si)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.2	2.1	2.0	<2.0
Strontium (Sr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00046	<0.00020	<0.00020	<0.00020
Tin (Sn)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	0.00051	0.00050	0.00050	0.00049	0.00049	0.00052	0.00053	0.00055	0.00053	0.00052	0.00050
Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-

Sample ID	BB-T2-27 APR 11	BB-T3-27 APR 11	BB-T4-27 APR 11	BB-T5-27 APR 11	BB-T6-27 APR 11	SC-T1-27 APR 11	SC-T2-27 APR 11	SC-T3-27 APR 11	SC-T4-27 APR 11	SC-T5-27 APR 11	SC-T6-27 APR 11
Site	**bb**	**bb**	**bb**	**bb**	**bb**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**
Sample	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**
TTS_Dist_CII	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**
Date Sampled	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11
Time Sampled	10:00	10:00	10:00	10:00	10:00	11:00	11:00	11:00	11:00	11:00	11:00
ALS Sample ID	L999052-2	L999052-3	L999052-4	L999052-5	L999052-6	L999052-7	L999052-8	L999052-9	L999052-10	L999052-11	L999052-12
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests											
Conductivity	139	140	140	141	140	142	142	142	141	141	141
Hardness (as CaCO3)	71.4	71.3	71.9	71.1	71.4	71.0	70.8	71.1	71.2	70.9	71.1
pH	7.97	7.98	7.99	7.99	8.01	7.97	7.99	8.00	7.99	8.00	8.00
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	4.8	3.3	3.3	<3.0	<3.0	<3.0
Total Dissolved Solids	78	84	82	88	85	89	79	69	82	85	78
Turbidity	0.42	0.48	0.49	0.44	0.45	0.59	0.45	0.44	0.59	0.52	0.40
Anions and Nutrients											
Alkalinity, Total (as CaCO3)	61.1	61.2	61.4	61.5	61.7	60.9	61.1	61.3	61.3	61.3	61.4
Ammonia, Total (as N)	0.0074	0.0140	0.0076	0.0077	<0.0050	0.0195	0.0099	0.0072	0.0074	0.0082	0.0077
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.81	0.82	0.82	0.82	0.82	0.99	0.82	0.81	0.80	0.81	0.81
Fluoride (F)	0.058	0.059	0.057	0.057	0.058	0.059	0.057	0.057	0.057	0.058	0.058
Nitrate (as N)	0.126	0.123	0.124	0.125	0.124	0.132	0.123	0.123	0.122	0.122	0.124
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen											
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0032	0.0036	0.0032	0.0036	0.0041	0.0062	0.0035	0.0035	0.0040	0.0036	0.0035
Sulfate (SO4)	11.4	11.4	11.4	11.4	11.4	11.9	11.4	11.4	11.4	11.4	11.4
Total Metals											
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Total Metals (Undigested)											
Aluminum (Al)-Total	0.0139	0.0119	0.0119	0.0107	0.0123	0.0231	0.0145	0.0117	0.0114	0.0107	0.0111
Antimony (Sb)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (Ba)-Total	0.023	0.022	0.022	0.022	0.022	0.022	0.022	0.023	0.023	0.022	0.023
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Total	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Total	0.000015	0.000011	0.000012	0.000012	0.000013	0.000030	0.000016	0.000014	0.000012	0.000011	0.000011
Calcium (Ca)-Total	21.0	20.5	20.9	21.1	21.0	20.8	20.6	20.5	20.8	20.6	21.0
Chromium (Cr)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Total	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead (Pb)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00067	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Total	4.94	4.85	4.95	5.03	5.04	4.91	4.93	4.86	4.96	4.86	4.94
Manganese (Mn)-Total	0.00159	0.00154	0.00145	0.00144	0.00143	0.00280	0.00151	0.00138	0.00144	0.00142	0.00146
Molybdenum (Mo)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Total	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silicon (Si)-Total	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Total	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Total	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	0.00052	0.00052	0.00055	0.00055	0.00054	0.00056	0.00053	0.00052	0.00052	0.00053	0.00053
Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals											
Dissolved Metals Filtration Location											
Aluminum (Al)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (Ba)-Dissolved	0.021	0.021	0.022	0.021	0.021	0.021	0.022	0.022	0.022	0.022	0.021
Beryllium (Be)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Dissolved	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Dissolved	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000023	0.000011	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca)-Dissolved	20.6	20.6	20.7	20.5	20.5	20.4	20.4	20.5	20.5	20.5	20.6
Chromium (Cr)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead (Pb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved	4.85	4.83	4.88	4.85	4.87	4.84	4.83	4.84	4.87	4.80	4.79
Manganese (Mn)-Dissolved	0.00053	0.00053	0.00052	0.00052	0.00051	0.00064	0.00053	0.00050	0.00052	0.00051	0.00055
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silicon (Si)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	0.00050	0.00049	0.00051	0.00050	0.00051	0.00051	0.00049	0.00049	0.00049	0.00050	0.00049
Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-

Sample ID	NB-T1-27 APR 11	NB-T2-27 APR 11	NB-T3-27 APR 11	NB-T4-27 APR 11	NB-T5-27 APR 11	NB-T6-27 APR 11	OB-T1-27 APR 11	OB-T2-27 APR 11	OB-T3-27 APR 11	OB-T4-27 APR 11	OB-T5-27 APR 11	OB-T6-27 APR 11	WS-T1-27 APR 11	WS-T2-27 APR 11	WS-T3-27 APR 11	WS-T4-27 APR 11	WS-T5-27 APR 11	WS-T6-27 APR 11	BB-G-R-3MAY11	SC-G-R-3MAY11
Site	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**bb**	**sc**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**230**	**230**	**230**	**230**	**230**	**230**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**-9720**	**-1975**
Date Sampled	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	27-APR-11	03-MAY-11	03-MAY-11
Time Sampled	12:00	12:00	12:00	12:00	12:00	12:00	13:30	13:30	13:30	13:30	13:30	13:30	14:45	14:45	14:45	14:45	14:45	14:45	10:45	11:47
ALS Sample ID	L999052-13	L999052-14	L999052-15	L999052-16	L999052-17	L999052-18	L999052-19	L999052-20	L999052-21	L999052-22	L999052-23	L999052-24	L999052-25	L999052-26	L999052-27	L999052-28	L999052-29	L999052-30	L1001275-1	L1001275-2
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																				
Conductivity	159	141	141	141	141	143	143	143	145	143	142	142	143	143	143	144	143	144	140	139
Hardness (as CaCO3)	72.9	70.9	71.4	70.9	70.9	71.5	71.6	71.5	71.7	71.6	71.3	71.9	71.2	71.5	71.8	71.3	71.2	71.3	70.5	69.8
pH	8.00	8.01	7.99	8.00	8.01	8.02	8.00	8.03	8.03	8.03	8.01	8.02	8.02	8.04	8.00	8.01	8.03	8.03	8.03	8.04
Total Suspended Solids	3.3	<3.0	<3.0	<3.0	<3.0	3.8	<3.0	<3.0	<3.0	<3.0	<3.0	3.8	<3.0	<3.0	<3.0	3.8	<3.0	3.3	<3.0	<3.0
Total Dissolved Solids	92	81	83	79	84	85	86	86	81	88	88	84	82	83	83	62	61	75	84	75
Turbidity	0.51	0.45	0.56	0.42	0.43	0.39	0.54	0.52	0.54	0.43	0.44	0.45	0.49	0.66	0.44	0.46	0.49	0.51	0.33	0.38
Anions and Nutrients																				
Alkalinity, Total (as CaCO3)	61.4	61.5	61.1	61.5	61.3	61.0	60.6	61.2	61.2	61.7	61.4	61.4	61.4	61.5	61.6	61.7	61.2	61.8	60.8	60.7
Ammonia, Total (as N)	0.0525	0.0113	0.0107	0.0121	0.0108	0.0246	0.0206	0.0130	0.0236	0.0110	0.0113	0.0134	0.0103	0.0129	0.0145	0.0140	0.0146	0.0117	0.0066	0.0096
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	1.11	0.82	0.82	0.82	0.82	0.97	0.93	0.87	0.89	0.82	0.83	0.84	0.89	0.85	0.86	0.86	0.85	0.89	0.99	0.95
Fluoride (F)	0.119	0.056	0.058	0.058	0.058	0.058	0.069	0.062	0.064	0.057	0.058	0.057	0.058	0.060	0.060	0.059	0.061	0.060	0.062	0.063
Nitrate (as N)	0.140	0.124	0.122	0.124	0.123	0.129	0.128	0.125	0.124	0.126	0.123	0.125	0.127	0.122	0.124	0.123	0.124	0.123	0.113	0.115
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen																				
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0042	0.0038	0.0040	0.0039	0.0039	0.0038	0.0042	0.0037	0.0041	0.0032	0.0036	0.0036	0.0039	0.0036	0.0036	0.0035	0.0036	0.0043	0.0035	0.0039
Sulfate (SO4)	19.0	11.4	11.5	11.5	11.5	12.3	12.9	12.3	12.6	11.5	11.5	11.8	11.8	11.8	11.9	11.8	11.8	11.9	11.2	11.4
Total Metals																				
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Total Metals (Undigested)																				
Aluminum (Al)-Total	0.0173	0.0157	0.0133	0.0123	0.0134	0.0114	0.0129	0.0114	0.0130	0.0104	0.0121	0.0107	0.0117	0.0124	0.0134	0.0144	0.0131	0.0319	0.0127	0.0138
Antimony (Sb)-Total	0.00311	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00060	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	0.00117	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (Ba)-Total	0.023	0.023	0.023	0.022	0.022	0.023	0.022	0.022	0.023	0.022	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.022	0.022
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Total	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Total	**0.000637**	0.000017	0.000014	0.000010	<0.000010	0.000047	**0.000083**	0.000033	**0.000063**	0.000013	0.000012	0.000014	0.000029	0.000032	0.000031	0.000032	0.000027	0.000033	<0.000010	0.000023
Calcium (Ca)-Total	21.9	20.9	20.8	20.4	20.7	20.9	20.8	20.7	21.4	20.7	21.1	20.9	21.1	21.1	20.8	20.9	21.3	21.3	20.8	20.7
Chromium (Cr)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Total	0.0015	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Total	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.041	<0.030	<0.030
Lead (Pb)-Total	0.00157	<0.00050	<0.00050	<0.00050	<0.00050	0.00064	0.00061	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Total	4.98	4.95	4.89	4.79	4.88	4.81	4.86	4.91	5.06	4.93	5.07	5.05	4.99	5.00	4.94	4.99	5.05	5.02	4.80	4.80
Manganese (Mn)-Total	0.00406	0.00184	0.00165	0.00166	0.00170	0.00262	0.00222	0.00175	0.00202	0.00166	0.00160	0.00202	0.00180	0.00196	0.00185	0.00185	0.00187	0.00271	0.00190	0.00193
Molybdenum (Mo)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Total	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Total	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silicon (Si)-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total	4.9	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	<2.0	2.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Total	0.00053	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Total	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	0.00053	0.00055	0.00053	0.00051	0.00052	0.00054	0.00053	0.00054	0.00054	0.00051	0.00052	0.00053	0.00053	0.00052	0.00051	0.00052	0.00053	0.00053	0.00056	0.00054
Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	0.0114	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Total	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Metals																				
Dissolved Metals Filtration Location																				
Aluminum (Al)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Antimony (Sb)-Dissolved	0.00290	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00059	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Dissolved	0.00106	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (Ba)-Dissolved	0.022	0.022	0.022	0.021	0.021	0.022	0.022	0.021	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.021	0.021
Beryllium (Be)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Bismuth (Bi)-Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Boron (B)-Dissolved	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Dissolved	0.000549	0.000010	0.000010	0.000010	<0.000010	0.000039	0.000068	0.000027	0.000053	<0.000010	<0.000010	<0.000010	0.000025	0.000023	0.000023	0.000025	0.000024	0.000022	<0.000010	0.000014
Calcium (Ca)-Dissolved	21.2	20.5	20.6	20.5	20.5	20.8	20.8	20.6	20.7	20.6	20.5	20.7	20.6	20.6	20.7	20.6	20.6	20.6	20.5	20.3
Chromium (Cr)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Iron (Fe)-Dissolved	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Lead (Pb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)-Dissolved	4.83	4.81	4.83	4.78	4.80	4.76	4.80	4.84	4.87	4.88	4.90	4.93	4.83	4.88	4.92	4.83	4.82	4.83	4.68	4.66
Manganese (Mn)-Dissolved	0.00279	0.00067	0.00069	0.00073	0.00069	0.00163	0.00110	0.00082	0.00102	0.00073	0.00065	0.00111	0.00084	0.00086	0.00080	0.00080	0.00087	0.00081	0.00035	0.00036
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium (K)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Selenium (Se)-Dissolved	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silicon (Si)-Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver (Ag)-Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Dissolved	4.6	<2.0	<2.0	<2.0	<2.0	<2.0	2.2	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Strontium (Sr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium (Tl)-Dissolved	0.00051	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00060
Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	0.00052	0.00049	0.00050	0.00050	0.00048	0.00050	0.00050	0.00050	0.00049	0.00050	0.00050	0.00050	0.00048	0.00049	0.00048	0.00047	0.00050	0.00048	0.00049	0.00049
Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	0.0082	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Zirconium (Zr)-Dissolved	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sample ID	NB-G-R-3MAY-11	OB-G-R-3MAY11	WS-G-L-3MAY11	BB-G-R-9MAY11	SC-G-R-9MAY11	NB-G-R-9MAY11	OB-G-R-9MAY11	WS-G-L-9MAY11	BB-T1 - 26JUL11	BB-T2 - 26JUL11	BB-T4 - 26JUL11	BB-T6 - 26JUL11	SC-T1 - 26JUL11	SC-T2 - 26JUL11	SC-T3 - 26JUL11	NB-T1 - 26JUL11
Site	**nb**	**ob**	**wa**	**bb**	**sc**	**nb**	**ob**	**wa**	**bb**	**bb**	**bb**	**bb**	**sc**	**sc**	**sc**	**nb**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**r-sh**
TTS_Dist_CII	**230**	**1090**	**15800**	**-9720**	**-1975**	**230**	**1090**	**15800**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**	**-1975**	**-1975**	**230**
Date Sampled	03-MAY-11	03-MAY-11	03-MAY-11	09-MAY-11	09-MAY-11	09-MAY-11	09-MAY-11	09-MAY-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11
Time Sampled	12:15	12:45	13:00	11:44	12:00	12:20	12:30	13:00	09:53	09:59	10:03	10:05	11:03	11:07	11:10	12:40
ALS Sample ID	L1001275-5	L1001275-3	L1001275-4	L1003156-1	L1003156-2	L1003156-3	L1003156-4	L1003156-5	L1036820-1	L1036820-2	L1036820-3	L1036820-4	L1036820-12	L1036820-13	L1036820-14	L1036820-23
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																
Conductivity	143	140	140	143	142	144	143	143	109	108	109	109	110	110	110	116
Hardness (as CaCO3)	69.9	70.1	70.0	70.1	69.1	69.8	70.6	69.8	54.0	54.3	53.9	54.3	54.4	54.5	54.8	56.3
pH	8.03	8.05	8.04	8.03	8.05	8.05	8.08	8.06	7.95	8.00	8.02	8.05	8.05	8.06	8.05	7.97
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	4.3	<3.0	3.0	<3.0	3.0	3.0	<3.0	<3.0	3.7
Total Dissolved Solids	83	82	78	81	77	81	82	83	57	58	51	52	53	59	61	57
Turbidity	0.62	0.36	0.63	0.49	0.62	0.61	0.38	1.07	0.81	0.79	0.80	0.78	0.86	0.79	0.85	1.15
Anions and Nutrients																
Alkalinity, Total (as CaCO3)	60.7	61.0	61.0	62.3	61.7	62.1	64.2	62.3	47.8	47.8	48.0	48.0	47.8	48.0	48.1	47.8
Ammonia, Total (as N)	0.0226	0.0102	<0.0050	0.0068	0.0066	0.0082	0.0050	0.0059	0.0067	0.0054	0.0055	0.0057	0.0065	0.0053	0.0064	0.0194
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloride (Cl)	0.97	0.95	0.98	0.88	0.89	0.92	0.88	0.92	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.67
Fluoride (F)	0.071	0.063	0.066	0.065	0.066	0.080	0.066	0.065	0.072	0.073	0.073	0.072	0.099	0.072	0.072	0.102
Nitrate (as N)	0.118	0.116	0.114	0.120	0.121	0.124	0.122	0.123	0.0575	0.0585	0.0565	0.0568	0.0595	0.0586	0.0566	0.0633
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.0016	0.0019	0.0022	0.0020	0.0017	0.0015	0.0015
Total Kjeldahl Nitrogen																
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0036	0.0103	0.0116	0.0040	0.0039	0.0043	0.0041	0.0097	0.0056	0.0072	0.0083	0.0062	0.0054	0.0060	0.0052	0.0237
Sulfate (SO4)	12.6	11.5	11.6	11.3	11.3	12.3	11.4	11.5	8.86	8.82	8.82	8.84	8.86	8.82	8.82	11.2
Total Metals																
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Total Metals (Undigested)																
Aluminum (Al)-Total	0.0117	0.0120	0.0130	<0.020	<0.025	<0.020	<0.020	0.0508	0.0241	0.0261	0.0266	0.0813	0.0239	0.0221	0.0233	0.0366
Antimony (Sb)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.000043	0.000044	0.000044	0.000041	0.000072	0.000035	0.000036	0.000766
Arsenic (As)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.000186	0.000192	0.000190	0.000242	0.000407	0.000197	0.000194	0.000526
Barium (Ba)-Total	0.022	0.022	0.022	0.022	0.023	0.022	0.023	0.023	0.0175	0.0175	0.0179	0.0185	0.0176	0.0176	0.0176	0.0183
Beryllium (Be)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	-	-	-	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	0.0000218	<0.0000050	<0.0000050	<0.0000050	0.0000163
Boron (B)-Total	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.000046	0.000021	0.000023	0.000012	0.000021	0.000034	0.000024	0.000031	0.0000173	0.0000161	0.0000179	0.0000163	0.0000238	0.0000139	0.0000157	**0.000509**
Calcium (Ca)-Total	20.4	20.8	21.0	20.4	20.8	20.5	20.5	21.0	15.7	15.8	16.0	16.0	16.0	16.2	16.3	16.9
Chromium (Cr)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	0.00014
Cobalt (Co)-Total	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0000209	0.0000213	0.0000189	0.0000181	0.0000207	0.0000166	0.0000197	0.0000373
Copper (Cu)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00033	0.00048	0.00032	0.00032	0.00033	0.00030	0.00031	0.00119
Iron (Fe)-Total	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.070	0.0220	0.0209	0.0225	0.0187	0.0220	0.0150	0.0167	0.0446
Lead (Pb)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	0.00053	0.000124	0.000158	0.000268	0.0000922	0.000748	0.000104	0.000106	0.00600
Lithium (Li)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.00092	0.00117	0.00136	0.00145	0.00147	0.00148	0.00168	0.00154
Magnesium (Mg)-Total	4.68	4.87	4.84	4.76	4.85	4.76	4.79	4.88	3.42	3.46	3.47	3.48	3.44	3.49	3.51	3.57
Manganese (Mn)-Total	0.00210	0.00189	0.00174	0.00165	0.00191	0.00189	0.00190	0.00403	0.00205	0.00221	0.00210	0.00209	0.00220	0.00188	0.00189	0.00337
Molybdenum (Mo)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000516	0.000511	0.000514	0.000511	0.000517	0.000516	0.000515	0.000547
Nickel (Ni)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000279	0.000265	0.000265	0.000308	0.000255	0.000257	0.000266	0.000323
Phosphorus (P)-Total	-	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.553	0.546	0.556	0.546	0.544	0.555	0.557	0.579
Selenium (Se)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000163	0.000182	0.000193	0.000176	0.000188	0.000192	0.000182	0.000547
Silicon (Si)-Total	-	-	-	-	-	-	-	-	1.69	1.72	1.70	1.71	1.74	1.77	1.76	1.78
Silver (Ag)-Total	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	1.19	1.20	1.22	1.24	1.19	1.19	1.17	1.82
Strontium (Sr)-Total	-	-	-	-	-	-	-	-	0.109	0.109	0.110	0.109	0.109	0.108	0.110	0.110
Thallium (Tl)-Total	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000021	0.0000024	0.000355
Tin (Sn)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000014
Titanium (Ti)-Total	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.00079	0.00073	0.00072	0.00321	0.00081	<0.00050	0.00060	0.00201
Uranium (U)-Total	0.00059	0.00059	0.00061	0.00050	0.00053	0.00052	0.00053	0.00054	0.000433	0.000434	0.000432	0.000428	0.000431	0.000428	0.000425	0.000446
Vanadium (V)-Total	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000154	0.000174	0.000174	0.000243	0.000164	0.000175	0.000161	0.000215
Zinc (Zn)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.00120	0.00119	0.00185	0.00128	0.00168	0.00150	0.00183	0.0118
Zirconium (Zr)-Total	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																
Dissolved Metals Filtration Location																
Aluminum (Al)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0111	0.0134	0.0124	0.0122	0.0115	0.0122	0.0119	0.0125
Antimony (Sb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.000049	0.000049	0.000050	0.000046	0.000060	0.000039	0.000038	0.000659
Arsenic (As)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.000187	0.000175	0.000182	0.000157	0.000437	0.000163	0.000167	0.000363
Barium (Ba)-Dissolved	0.021	0.021	0.021	0.021	0.021	0.021	0.022	0.021	0.0172	0.0176	0.0172	0.0170	0.0172	0.0172	0.0173	0.0178
Beryllium (Be)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	-	-	-	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.0050	0.0058	0.0060	0.0073	0.0076	0.0054	<0.0050	0.0059
Cadmium (Cd)-Dissolved	0.000042	0.000012	0.000025	0.000012	0.000022	0.000026	0.000012	0.000016	0.0000064	0.0000140	0.0000097	0.0000065	0.0000153	0.0000091	0.0000078	0.000423
Calcium (Ca)-Dissolved	20.3	20.4	20.4	20.3	20.0	20.3	20.4	20.3	16.0	16.0	15.9	16.0	16.1	16.1	16.2	16.8
Chromium (Cr)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00011	0.00013	0.00014	0.00015	0.00015	0.00020	0.00011	0.00016
Cobalt (Co)-Dissolved	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0000080	0.0000120	0.0000094	0.0000083	0.0000060	0.0000066	0.0000058	0.0000147
Copper (Cu)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.00028	0.00025	0.00030	0.00029	0.00028	0.00028	0.00028	0.00055
Iron (Fe)-Dissolved	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	0.0023	0.0182	0.0019	0.0020	0.0019	0.0021	0.0019	0.0025
Lead (Pb)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0000101	0.0000746	0.0000160	0.0000079	0.0000141	0.0000104	0.0000094	0.000703
Lithium (Li)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00050	0.00132	0.00137	0.00148	0.00150	0.00145	0.00164	0.00151
Magnesium (Mg)-Dissolved	4.65	4.68	4.64	4.73	4.64	4.66	4.77	4.66	3.44	3.47	3.43	3.46	3.46	3.47	3.48	3.50
Manganese (Mn)-Dissolved	0.00063	0.00035	0.00052	0.00080	0.00060	0.00066	0.00076	0.00066	0.000106	0.000159	0.000075	0.000105	0.000110	0.000093	0.000094	0.000762
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000554	0.000564	0.000563	0.000548	0.000533	0.000542	0.000550	0.000561
Nickel (Ni)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000241	0.000357	0.000278	0.000269	0.000274	0.000248	0.000244	0.000325
Phosphorus (P)-Dissolved	-	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.547	0.551	0.554	0.558	0.553	0.533	0.561	0.578
Selenium (Se)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000175	0.000169	0.000167	0.000174	0.000164	0.000175	0.000167	0.000525
Silicon (Si)-Dissolved	-	-	-	-	-	-	-	-	1.65	1.65	1.65	1.66	1.69	1.67	1.67	1.69
Silver (Ag)-Dissolved	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	1.19	1.22	1.22	1.20	1.20	1.18	1.18	1.86
Strontium (Sr)-Dissolved	-	-	-	-	-	-	-	-	0.109	0.111	0.111	0.111	0.109	0.109	0.109	0.110
Thallium (Tl)-Dissolved	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0000020	<0.0000020	<0.0000020	0.0000022	0.0000027	<0.0000020	0.0000026	0.000352
Tin (Sn)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.00053	0.00050	0.00051	0.00047	0.00046	0.00046	0.00049	0.00048	0.000436	0.000454	0.000447	0.000429	0.000425	0.000424	0.000428	0.000432
Vanadium (V)-Dissolved	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.000131	0.000153	0.000132	0.000128	0.000139	0.000129	0.000127	0.000134
Zinc (Zn)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.00182	0.00071	0.00165	0.00159	0.00179	0.00120	0.00123	0.00854
Zirconium (Zr)-Dissolved	-	-	-	-	-	-	-	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Note:

The bolded values indicate individual number exceeds the maximum, whereas the underlined values indicate individual number exceeds approprite mean value.

Sample ID	NB-T2 - 26JUL11	NB-T3 - 26JUL11	OB-T1 - 26JUL11	OB-T2 - 26JUL11	OB-T3 - 26JUL11	WS-T1 - 26JUL11	WS-T2 - 26JUL11	WS-T4 - 26JUL11	WS-T6 - 26JUL11	CII-5M - 26JUL11	CII-15M - 26JUL11	CII-35M - 26JUL11	CIII-5M - 26JUL11	CIII-15M - 26JUL11	CIII-35M - 26JUL11	CIV-5M - 26JUL11	CIV-15M - 26JUL11	CIV-35M - 26JUL11	BB-G-R-12SEP11	SC-G-R-12SEP11	NB-G-R-12SEP11	OB-G-R-12SEP11	WS-G-L-12SEP11	BB-T1-17NOV11	BB-T2-17NOV11	BB-T4-17NOV11	BB-T6-17NOV11
Site	**nb**	**nb**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**										**bb**	**sc**	**nb**	**ob**	**wa**	**bb**	**bb**	**bb**	**bb**
Sample	**r-1md**	**r-1mab**	**r-sh**	**r-1md**	**r-1mab**	**r-sh**	**r-1md**	**l-1md**	**l-sh**										**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**l-1md**	**l-sh**
TTS_Dist_CII	**230**	**230**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**										**-9720**	**-1975**	**230**	**1090**	**15800**	**-9720**	**-9720**	**-9720**	**-9720**
Date Sampled	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	26-JUL-11	12-SEP-11	12-SEP-11	12-SEP-11	12-SEP-11	12-SEP-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11
Time Sampled	12:45	12:48	12:55	12:58	13:00	13:38	13:41	13:45	13:48	00:00	00:00	00:00	00:00	00:00	00:00	10:42	10:45	10:52	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L1036820-24	L1036820-25	L1036820-26	L1036820-27	L1036820-28	L1036820-5	L1036820-6	L1036820-7	L1036820-8	L1036820-17	L1036820-18	L1036820-19	L1036820-20	L1036820-21	L1036820-22	L1036820-9	L1036820-10	L1036820-11	L1057476-1	L1057476-2	L1057476-3	L1057476-4	L1057476-5	L1086508-1	L1086508-2	L1086508-3	L1086508-4
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																											
Conductivity	110	111	112	111	111	110	110	110	110	115	114	115	123	127	118	109	110	110	108	111	115	113	112	118	119	119	119
Hardness (as CaCO3)	54.9	54.8	55.3	55.4	55.6	54.9	55.0	54.5	54.9	56.1	55.5	55.8	55.3	58.5	58.7	55.0	54.7	54.5	55.4	56.1	56.9	56.1	56.0	58.4	58.7	58.4	58.3
pH	8.03	8.04	8.04	8.02	8.04	8.03	8.04	8.04	8.06	8.05	8.06	8.05	8.07	8.06	8.05	8.05	8.06	8.07	7.97	8.03	8.04	8.03	8.04	7.94	7.93	7.96	7.95
Total Suspended Solids	<3.0	3.7	<3.0	<3.0	<3.0	3.0	<3.0	3.0	4.3	4.3	<3.0	3.0	<3.0	<3.0	3.0	<3.0	<3.0	3.0	3.3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	55	51	55	53	53	62	55	55	56	57	55	55	71	69	55	57	56	61	64	66	71	66	61	69	77	69	95
Turbidity	0.89	0.77	0.86	0.76	0.83	0.88	0.83	0.88	1.13	0.88	0.91	0.91	0.84	0.90	0.88	0.82	0.83	0.85	0.62	0.58	0.63	0.68	0.68	0.40	0.50	0.59	0.46
Anions and Nutrients																											
Alkalinity, Total (as CaCO3)	48.1	48.1	48.1	48.1	48.1	48.1	48.0	48.0	47.9	47.9	48.1	48.2	48.1	48.0	48.1	47.9	48.1	48.1	49.7	50.1	50.3	50.2	50.2	51.0	51.4	51.4	51.4
Ammonia, Total (as N)	0.0092	0.0075	0.0104	0.0077	0.0066	0.0081	0.0083	0.0079	0.0083	0.0170	0.0159	0.0170	0.0183	0.0317	0.0327	0.0235	0.0061	0.0061	<0.0050	0.0129	0.0309	0.0120	0.0103	<0.0050	<0.0050	<0.0050	<0.0050
Bromide (Br)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloride (Cl)	0.52	0.52	0.55	0.53	0.52	0.53	0.53	0.61	0.54	0.63	0.62	0.61	0.72	0.84	0.73	0.52	0.52	0.51	<0.50	0.50	0.56	0.52	0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	0.071	0.067	0.078	0.073	0.072	0.074	0.084	0.074	0.080	0.102	0.096	0.103	0.149	0.179	0.127	0.072	0.075	0.072	0.058	0.058	0.074	0.063	0.061	0.060	0.060	0.060	0.060
Nitrate (as N)	0.0565	0.0579	0.0599	0.0578	0.0606	0.0572	0.0583	0.0578	0.0565	0.0594	0.0615	0.0580	0.0614	0.0623	0.0612	0.0599	0.0574	0.0578	0.0353	0.0364	0.0379	0.0376	0.0384	0.101	0.102	0.103	0.101
Nitrite (as N)	0.0014	0.0011	0.0017	0.0011	0.0011	0.0022	0.0024	0.0017	0.0025	0.0014	0.0017	0.0015	0.0016	0.0015	0.0013	0.0017	0.0022	0.0011	0.0016	0.0014	0.0014	0.0013	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen																											
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	0.0021	0.0022	0.0026	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0021	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0059	0.0073	0.0063	0.0053	0.0064	0.0091	0.0070	0.0069	0.0087	0.0063	0.0063	0.0073	0.0062	0.0059	0.0069	0.0067	0.0063	0.0064	0.0058	0.0052	0.0052	0.0050	0.0055	0.0043	0.0042	0.0044	0.0040
Sulfate (SO4)	8.82	8.83	9.28	8.95	8.92	8.92	8.93	8.94	8.94	10.6	10.2	11.0	14.1	15.7	12.0	8.81	8.84	8.83	8.55	8.56	10.0	9.05	8.88	9.75	9.76	9.79	9.78
Total Metals																											
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Total Metals (Undigested)																											
Aluminum (Al)-Total	0.0225	0.0227	0.0240	0.0230	0.0223	0.0302	0.0255	0.0260	0.0442	0.0295	0.0333	0.0297	0.0337	0.0555	0.0307	0.0239	0.0254	0.0246	0.0160	0.0157	0.0170	0.0174	0.0165	0.0110	0.0111	0.0103	0.0109
Antimony (Sb)-Total	0.000035	0.000035	0.000187	0.000067	0.000075	0.000107	0.000093	0.000086	0.000090	0.000649	0.000553	0.000580	0.00121	0.00203	0.00148	0.000041	0.000040	0.000059	0.000033	0.000032	0.00183	0.000282	0.000218	0.000029	0.000030	0.000028	0.000028
Arsenic (As)-Total	0.000197	0.000180	0.000266	0.000202	0.000216	0.000205	0.000201	0.000195	0.000229	0.000348	0.000327	0.000355	0.000442	0.000580	0.000486	0.000193	0.000182	0.000357	0.000171	0.000185	0.000475	0.000211	0.000208	0.000165	0.000163	0.000145	0.000180
Barium (Ba)-Total	0.0179	0.0182	0.0183	0.0181	0.0178	0.0177	0.0173	0.0173	0.0176	0.0180	0.0180	0.0181	0.0182	0.0185	0.0182	0.0174	0.0177	0.0178	0.0171	0.0171	0.0174	0.0173	0.0174	0.0167	0.0167	0.0165	0.0168
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000152	0.0000176	**0.0000731**	0.0000229	0.0000296	0.0000290	0.0000266	0.0000278	0.0000306	**0.000292**	**0.000187**	**0.000376**	**0.0000614**	**0.0000722**	0.0000437	0.0000141	0.0000158	0.0000275	0.0000078	0.0000088	**0.000250**	0.0000467	0.0000307	0.0000088	0.0000077	0.0000067	0.0000159
Calcium (Ca)-Total	16.6	16.4	16.5	16.4	16.4	16.3	16.4	16.2	16.3	16.7	16.3	16.8	17.1	17.8	17.5	16.0	16.2	16.2	17.1	17.1	17.6	16.9	17.2	17.3	17.4	17.4	17.6
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	0.00011	0.00011	<0.00010	0.00016	<0.00010	<0.00010	0.00012	0.00011	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000150	0.0000252	0.0000234	0.0000188	0.0000178	0.0000275	0.0000208	0.0000225	0.0000346	0.0000309	0.0000261	0.0000253	0.0000252	0.0000387	0.0000261	0.0000193	0.0000196	0.0000218	0.0000129	0.0000119	0.0000190	0.0000170	0.0000170	0.0000089	0.0000089	0.0000099	0.0000089
Copper (Cu)-Total	0.00032	0.00033	0.00037	0.00033	0.00032	0.00047	0.00042	0.00038	0.00056	0.00039	0.00045	0.00046	0.00046	0.00057	0.00055	0.00030	0.00032	0.00207	0.00032	0.00030	0.00056	0.00034	0.00039	0.00029	0.00028	0.00028	0.00029
Iron (Fe)-Total	0.0164	0.0175	0.0219	0.0167	0.0180	0.0329	0.0249	0.0226	0.0565	0.0304	0.0381	0.0270	0.0296	0.0699	0.0319	0.0209	0.0198	0.0219	0.0102	0.0106	0.0122	0.0108	0.0113	0.0093	0.0090	0.0081	0.0088
Lead (Pb)-Total	0.000105	0.000112	0.000529	0.000166	0.000152	0.000261	0.000157	0.000152	0.000335	0.000523	0.000546	0.000570	0.000566	0.00122	0.000503	0.000189	0.000138	0.000372	0.0000576	0.0000634	0.000288	0.000197	0.000122	0.0000942	0.0000483	0.0000447	0.000104
Lithium (Li)-Total	0.00138	0.00159	0.00145	0.00140	0.00142	0.00161	0.00159	0.00161	0.00155	0.00158	0.00154	0.00148	0.00148	0.00145	0.00138	0.00154	0.00162	0.00145	0.00072	0.00076	0.00087	0.00082	0.00086	0.00096	0.00093	0.00087	0.00097
Magnesium (Mg)-Total	3.60	3.55	3.55	3.56	3.58	3.58	3.60	3.53	3.57	3.52	3.45	3.54	3.52	3.53	3.53	3.49	3.52	3.50	3.49	3.48	3.45	3.42	3.45	3.72	3.74	3.74	3.76
Manganese (Mn)-Total	0.00186	0.00199	0.00225	0.00199	0.00200	0.00289	0.00237	0.00217	0.00358	0.00291	0.00275	0.00313	0.00233	0.00310	0.00246	0.00206	0.00205	0.00215	0.00169	0.00172	0.00302	0.00198	0.00206	0.00129	0.00124	0.00126	0.00125
Molybdenum (Mo)-Total	0.000516	0.000533	0.000529	0.000514	0.000503	0.000513	0.000516	0.000486	0.000505	0.000535	0.000545	0.000538	0.000590	0.000629	0.000596	0.000497	0.000507	0.000499	0.000514	0.000513	0.000739	0.000544	0.000501	0.000471	0.000483	0.000491	0.000487
Nickel (Ni)-Total	0.000269	0.000265	0.000287	0.000257	0.000257	0.000287	0.000280	0.000256	0.000296	0.000287	0.000320	0.000296	0.000303	0.000321	0.000322	0.000266	0.000267	0.000290	0.000312	0.000292	0.000303	0.000316	0.000290	0.000323	0.000346	0.000317	0.000322
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.548	0.591	0.557	0.551	0.558	0.568	0.579	0.566	0.574	0.540	0.549	0.577	0.652	0.627	0.574	0.559	0.561	0.547	0.575	0.561	0.651	0.574	0.551	0.626	0.616	0.640	0.636
Selenium (Se)-Total	0.000182	0.000199	0.000250	0.000184	0.000206	0.000207	0.000199	0.000195	0.000197	0.000434	0.000464	0.000535	0.00109	0.00135	0.000852	0.000194	0.000182	0.000181	0.000153	0.000153	0.000794	0.000263	0.000190	0.000137	0.000144	0.000160	0.000146
Silicon (Si)-Total	1.81	1.78	1.78	1.80	1.80	1.79	1.77	1.74	1.76	1.75	1.75	1.77	1.75	1.76	1.75	1.72	1.74	1.75	1.12	1.13	1.12	1.10	1.10	1.56	1.56	1.56	1.57
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.21	1.25	1.35	1.22	1.24	1.24	1.21	1.23	1.22	1.41	1.49	1.92	2.96	2.87	1.91	1.18	1.19	1.20	1.20	1.22	2.70	1.41	1.31	1.15	1.17	1.13	1.14
Strontium (Sr)-Total	0.109	0.108	0.111	0.108	0.110	0.110	0.109	0.109	0.108	0.110	0.110	0.110	0.111	0.110	0.110	0.107	0.110	0.108	0.0938	0.0951	0.0953	0.0947	0.0955	0.0944	0.0953	0.0958	0.0972
Thallium (Tl)-Total	0.0000021	0.0000022	0.0000716	0.0000180	0.0000187	0.0000175	0.0000169	0.0000179	0.0000182	0.000216	0.000229	0.000400	0.000982	0.00116	0.000615	<0.0000020	<0.0000020	0.0000023	0.0000026	0.0000026	0.000152	0.0000213	0.0000075	0.0000026	0.0000026	0.0000026	0.0000036
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	0.00053	0.00065	0.00086	<0.00050	<0.00050	0.00184	0.00060	0.00074	0.00278	0.00129	0.00135	0.00112	0.00160	0.00618	0.00129	0.00090	0.00071	0.00073	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	<0.00050
Uranium (U)-Total	0.000430	0.000425	0.000437	0.000431	0.000435	0.000437	0.000425	0.000427	0.000433	0.000431	0.000440	0.000440	0.000429	0.000436	0.000432	0.000428	0.000415	0.000427	0.000394	0.000388	0.000387	0.000393	0.000402	0.000377	0.000377	0.000376	0.000382
Vanadium (V)-Total	0.000152	0.000182	0.000171	0.000159	0.000155	0.000195	0.000171	0.000154	0.000225	0.000186	0.000194	0.000185	0.000190	0.000314	0.000206	0.000155	0.000154	0.000167	0.000127	0.000143	0.000134	0.000126	0.000133	0.000103	0.000099	0.000108	0.000108
Zinc (Zn)-Total	0.00189	0.00189	0.00240	0.00167	0.00174	0.00189	0.00171	0.00159	0.00321	0.00675	0.00624	0.00831	0.00254	0.00414	0.00278	0.00112	0.00136	0.00246	0.00094	<0.00050	0.00531	0.00116	0.00114	0.00090	0.00068	<0.00050	0.00088
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																											
Dissolved Metals Filtration Location																											
Aluminum (Al)-Dissolved	0.0111	0.0116	0.0121	0.0110	0.0109	0.0116	0.0113	0.0116	0.0116	0.0124	0.0159	0.0137	0.0119	0.0144	0.0130	0.0106	0.0121	0.0111	0.00871	0.00904	0.0111	0.00883	0.00973	0.00562	0.00468	0.00442	0.00499
Antimony (Sb)-Dissolved	0.000036	0.000036	0.000167	0.000071	0.000064	0.000097	0.000089	0.000087	0.000086	0.000658	0.000588	0.000557	0.000231	0.00207	0.00184	0.000039	0.000043	0.000044	0.000039	0.000037	0.000943	0.000313	0.000222	0.000032	0.000028	0.000027	0.000027
Arsenic (As)-Dissolved	0.000165	0.000167	0.000220	0.000179	0.000175	0.000198	0.000185	0.000198	0.000187	0.000325	0.000299	0.000303	0.000265	0.000574	0.000524	0.000171	0.000191	0.000177	0.000167	0.000189	0.000321	0.000188	0.000185	0.000144	0.000152	0.000140	0.000139
Barium (Ba)-Dissolved	0.0173	0.0175	0.0175	0.0173	0.0169	0.0169	0.0171	0.0173	0.0172	0.0175	0.0176	0.0175	0.0173	0.0176	0.0176	0.0171	0.0172	0.0170	0.0163	0.0169	0.0168	0.0166	0.0169	0.0162	0.0163	0.0162	0.0162
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	0.0054	0.0053	0.0059	0.0077	<0.0050	0.0051	0.0061	0.0068	0.0072	0.0062	0.0064	0.0055	0.0063	0.0076	0.0067	0.0072	0.0056	0.0063	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000074	0.0000097	0.0000477	0.0000144	0.0000159	0.0000183	0.0000268	0.0000172	0.0000174	0.000293	0.000204	0.000209	0.0000141	0.0000571	0.0000304	0.0000084	0.0000098	0.0000108	<0.0000050	<0.0000050	0.0000936	0.0000327	0.0000178	0.0000077	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Dissolved	16.2	16.2	16.3	16.4	16.4	16.2	16.2	16.1	16.2	16.7	16.5	16.6	16.4	17.7	17.7	16.3	16.2	16.1	16.6	16.8	17.2	16.9	16.8	17.3	17.4	17.3	17.2
Chromium (Cr)-Dissolved	0.00013	0.00013	0.00014	0.00014	<0.00010	0.00012	0.00014	0.00015	0.00012	0.00013	0.00012	0.00012	0.00013	0.00016	0.00017	0.00010	0.00013	0.00014	<0.00010	0.00011	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000077	0.0000072	0.0000067	0.0000072	0.0000090	0.0000058	0.0000110	<0.0000050	0.0000069	0.0000089	0.0000084	0.0000072	0.0000079	0.0000080	0.0000077	0.0000057	0.0000067	0.0000069	0.0000079	0.0000089	0.0000099	<0.0000050	0.0000079	<0.0000050	0.0000059	<0.0000050	0.0000059
Copper (Cu)-Dissolved	0.00026	0.00027	0.00032	0.00030	0.00027	0.00034	0.00032	0.00033	0.00032	0.00037	0.00033	0.00037	0.00038	0.00044	0.00040	0.00027	0.00033	0.00029	0.00027	0.00029	0.00032	0.00029	0.00031	0.00022	0.00022	0.00021	0.00021
Iron (Fe)-Dissolved	0.0019	0.0029	0.0020	0.0021	0.0020	0.0022	0.0055	0.0018	0.0018	0.0028	0.0024	0.0022	0.0031	0.0025	0.0022	0.0018	0.0021	0.0019	0.0010	0.0011	0.0015	<0.0010	0.0010	<0.0010	0.0019	<0.0010	<0.0010
Lead (Pb)-Dissolved	0.0000125	0.0000113	0.0000354	0.0000136	0.0000157	0.0000172	0.0000984	0.0000288	0.0000098	0.0000552	0.0000435	0.0000523	0.0000198	0.000155	0.0000620	0.0000105	0.0000177	0.0000280	0.0000061	0.0000091	0.0000159	0.0000071	0.0000081	0.0000161	0.0000067	<0.0000050	<0.0000050
Lithium (Li)-Dissolved	0.00145	0.00150	0.00139	0.00136	<0.00050	0.00166	0.00156	0.00164	0.00161	0.00153	0.00154	0.00152	0.00142	0.00154	0.00144	0.00169	0.00156	0.00146	0.00080	0.00077	0.00082	0.00076	0.00076	0.00090	0.00089	0.00093	0.00090
Magnesium (Mg)-Dissolved	3.51	3.51	3.52	3.55	3.55	3.53	3.53	3.49	3.51	3.50	3.48	3.50	3.49	3.47	3.51	3.50	3.49	3.48	3.38	3.42	3.42	3.39	3.40	3.69	3.73	3.69	3.70
Manganese (Mn)-Dissolved	0.000080	0.000115	0.000123	0.000136	0.000083	0.000155	0.000202	0.000105	0.000115	0.000450	0.000307	0.000291	0.000118	0.000144	0.000123	0.000099	0.000100	0.000094	0.000076	0.000073	0.000175	0.000087	0.000074	0.000243	0.000229	0.000212	0.000184
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	0.000540	0.000534	0.000533	0.000523	0.000503	0.000541	0.000548	0.000530	0.000539	0.000575	0.000565	0.000564	0.000546	0.000668	0.000645	0.000551	0.000556	0.000534	0.000520	0.000539	0.000634	0.000566	0.000547	0.000510	0.000511	0.000480	0.000513
Nickel (Ni)-Dissolved	0.000267	0.000268	0.000300	0.000266	0.000271	0.000268	0.000309	0.000274	0.000265	0.000267	0.000273	0.000284	0.000273	0.000302	0.000288	0.000254	0.000264	0.000260	0.000319	0.000292	0.000283	0.000303	0.000301	0.000294	0.000292	0.000271	0.000293
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.532	0.544	0.554	0.538	0.528	0.563	0.566	0.561	0.563	0.538	0.564	0.586	0.561	0.664	0.585	0.539	0.549	0.554	0.537	0.533	0.604	0.552	0.556	0.607	0.631	0.618	0.614
Selenium (Se)-Dissolved	0.000158	0.000177	0.000233	0.000178	0.000173	0.000180	0.000176	0.000182	0.000183	0.000438	0.000413	0.000513	0.000301	0.00142	0.00104	0.000172	0.000166	0.000180	0.000121	0.000151	0.000463	0.000239	0.000170	0.000117	0.000127	0.000124	0.000130
Silicon (Si)-Dissolved	1.68	1.69	1.68	1.70	1.70	1.69	1.67	1.66	1.66	1.67	1.66	1.67	1.67	1.66	1.68	1.67	1.68	1.66	1.04	1.05	1.05	1.04	1.04	1.52	1.53	1.52	1.53
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.21	1.22	1.31	1.23	1.09	1.21	1.22	1.24	1.22	1.46	1.48	1.94	1.51	3.27	2.12	1.19	1.19	1.18	1.18	1.21	2.02	1.39	1.28	1.15	1.15	1.14	1.14
Strontium (Sr)-Dissolved	0.108	0.109	0.108	0.109	0.102	0.107	0.107	0.108	0.109	0.108	0.109	0.108	0.107	0.109	0.110	0.109	0.109	0.109	0.0950	0.0950	0.0946	0.0950	0.0955	0.0945	0.0952	0.0962	0.0954
Thallium (Tl)-Dissolved	0.0000028	0.0000029	0.0000690	0.0000182	0.0000178	0.0000163	0.0000185	0.0000174	0.0000181	0.000234	0.000233	0.000399	0.000166	0.00130	0.000797	0.0000026	0.0000031	0.0000021	<0.0000020	0.0000026	0.0000892	0.0000213	0.0000075	0.0000036	0.0000036	0.0000036	0.0000036
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00015	<0.00010	<0.00010	<0.00010	<0.00030	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000434	0.000435	0.000440	0.000434	0.000416	0.000421	0.000434	0.000426	0.000432	0.000431	0.000434	0.000435	0.000432	0.000428	0.000437	0.000431	0.000430	0.000432	0.000397	0.000412	0.000400	0.000406	0.000414	0.000377	0.000381	0.000386	0.000389
Vanadium (V)-Dissolved	0.000141	0.000127	0.000131	0.000128	0.000116	0.000125	0.000144	0.000127	0.000118	0.000147	0.000132	0.000145	0.000131	0.000136	0.000142	0.000131	0.000143	0.000125	0.000115	0.000124	0.000118	0.000117	0.000112	0.000098	0.000098	0.000089	0.000093
Zinc (Zn)-Dissolved	0.00169	0.00231	0.00199	0.00229	0.00135	0.00160	0.00101	0.00123	0.00130	0.00604	0.00511	0.00528	0.00142	0.00299	0.00212	0.00125	0.00109	0.00128	0.00098	0.00093	0.00268	0.00089	0.00089	0.00067	<0.00050	<0.00050	0.00055
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	SC-T1-17NOV11	SC-T2-17NOV11	SC-T3-17NOV11	NB-T1-17NOV11	NB-T2-17NOV11	NB-T3-17NOV11	OB-T1-17NOV11	OB-T2-17NOV11	OB-T3-17NOV11	WS-T1-17NOV11	WS-T2-17NOV11	WS-T4-17NOV11	WS-T6-17NOV11	CII-5M-17NOV11	CII-15M-17NOV11	CII-35M-17NOV11	CIII-5M-17NOV-11	CIII-15M-17NOV-11	CIII-35M-17NOV-11	CIV-5M-17NOV11	CIV-15M-17NOV11	CIV-35M-17NOV11	SCO-5M-17NOV11	SCO-15M-17NOV11	SCO-35M-17NOV11	BB-G-R-28MAR12
Site	**sc**	**sc**	**sc**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**													**bb**
Sample	**r-sh**	**r-1md**	**l-1mab**	**r-sh**	**r-1md**	**r-1mab**	**r-sh**	**r-1md**	**r-1mab**	**r-sh**	**r-1md**	**l-1md**	**l-sh**													**r-sh**
TTS_Dist_CII	**-1975**	**-1975**	**-1975**	**230**	**230**	**230**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**													**-9720**
Date Sampled	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	17-NOV-11	28-Mar-12
Time Sampled	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	0:00	11:30
ALS Sample ID	L1086508-5	L1086508-6	L1086508-7	L1086508-8	L1086508-9	L1086508-10	L1086508-11	L1086508-12	L1086508-13	L1086508-14	L1086508-15	L1086508-16	L1086508-17	L1086508-18	L1086508-19	L1086508-20	L1086508-21	L1086508-22	L1086508-23	L1086508-24	L1086508-25	L1086508-26	L1086508-27	L1086508-28	L1086508-29	L1129175-1
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																										
Conductivity	119	119	119	132	119	119	121	120	121	120	122	120	120	134	133	131	124	125	127	120	120	120	120	121	120	136
Hardness (as CaCO3)	58.2	58.6	58.2	60.9	58.2	58.0	58.8	58.7	57.9	57.8	58.0	58.4	58.3	61.3	61.2	60.8	60.6	60.3	60.2	58.0	59.3	58.7	58.3	58.6	58.6	68.6
pH	7.95	7.94	7.95	7.93	7.96	7.95	7.94	7.95	8.03	7.94	7.98	7.97	7.95	7.97	7.96	7.97	7.97	7.98	7.96	7.96	7.97	7.96	7.96	7.97	7.95	7.96
Total Suspended Solids	<3.0	<3.0	3.1	3.8	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	88	74	75	84	70	91	74	78	72	82	81	75	81	105	82	85	75	85	76	74	73	80	75	78	79	77
Turbidity	0.45	0.39	0.78	0.67	0.64	0.66	0.49	0.65	0.58	0.46	0.51	0.56	0.51	0.53	0.56	0.56	0.65	0.50	0.51	0.38	0.42	0.49	0.59	0.50	0.50	0.38
Anions and Nutrients																										
Alkalinity, Total (as CaCO3)	51.2	51.2	51.2	51.4	51.4	51.4	51.3	51.6	53.5	51.5	51.5	52.5	52.3	52.9	52.5	52.5	52.4	52.7	52.4	52.6	52.8	52.3	52.2	52.3	52.2	63.1
Ammonia, Total (as N)	0.0100	<0.0050	<0.0050	0.0432	<0.0050	<0.0050	0.0137	0.0090	0.0092	0.0076	0.0089	0.0088	0.0087	0.0468	0.0446	0.0425	0.0149	0.0201	0.0227	0.0424	0.0295	0.0069	0.0083	0.0098	0.0101	<0.0050
Bromide (Br)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chloride (Cl)	0.50	<0.50	<0.50	1.05	<0.50	<0.50	0.57	0.52	0.52	0.51	0.51	0.52	0.52	0.98	0.98	0.92	0.60	0.63	0.68	0.51	0.51	<0.50	0.52	0.51	0.51	**0.68**
Fluoride (F)	0.060	0.060	0.059	0.115	0.060	0.060	0.068	0.064	0.063	0.061	0.061	0.061	0.061	0.114	0.112	0.106	0.080	0.086	0.095	0.062	0.061	0.061	0.063	0.064	0.061	0.062
Nitrate (as N)	0.103	0.102	0.102	0.117	0.102	0.101	0.105	0.102	0.103	0.103	0.102	0.103	0.103	0.113	0.112	0.111	0.103	0.103	0.104	0.102	0.102	0.102	0.107	0.105	0.102	0.158
Nitrite (as N)	0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen																										
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	0.0025	<0.0020	0.0020	<0.0020	<0.0020	0.0021	0.0023	<0.0020	0.0021	<0.0020	0.0026	0.0025	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0045	0.0040	0.0041	0.0042	0.0041	0.0040	0.0041	0.0040	0.0042	0.0043	0.0046	0.0039	0.0046	0.0043	0.0044	0.0044	0.0046	0.0044	0.0049	0.0050	0.0048	0.0044	0.0087	0.0057	0.0044	0.0036
Sulfate (SO4)	9.88	9.78	9.78	14.9	9.79	9.78	10.7	10.3	10.2	9.93	9.94	9.92	9.94	14.9	14.6	13.9	11.4	11.9	12.7	10.1	9.98	9.87	9.97	9.96	9.92	11.6
Total Metals																										
Mercury (Hg)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000013	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00050
Total Metals (Undigested)																										
Aluminum (Al)-Total	0.0103	0.0118	0.0103	0.0436	0.0113	0.0105	0.0113	0.0106	0.00999	0.0112	0.0112	0.0106	0.0145	0.0132	0.0131	0.0132	0.0131	0.0129	0.0126	0.0115	0.0124	0.0111	0.0416	0.0207	0.0113	0.0127
Antimony (Sb)-Total	0.000041	0.000029	0.000024	0.00143	0.000027	0.000032	0.000183	0.000113	0.000087	0.000068	0.000066	0.000062	0.000068	0.00107	0.00105	0.00102	0.000355	0.000462	0.000897	0.000031	0.000035	0.000036	0.000312	0.000118	0.000040	0.000029
Arsenic (As)-Total	0.000334	0.000184	0.000171	0.00133	0.000169	0.000174	0.000283	0.000202	0.000196	0.000188	0.000163	0.000197	0.000188	0.000883	0.000986	0.000937	0.000444	0.000521	0.000831	0.000153	0.000178	0.000179	0.00258	0.000414	0.000321	0.000169
Barium (Ba)-Total	0.0168	0.0192	0.0166	0.0176	0.0165	0.0165	0.0168	0.0167	0.0166	0.0167	0.0167	0.0168	0.0167	0.0170	0.0169	0.0170	0.0168	0.0167	0.0169	0.0169	0.0169	0.0169	0.0175	0.0168	0.0166	0.0188
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	0.0000525	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000130	0.0000351	0.0000312	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000072	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000230	0.0000078	0.0000088	**0.00118**	0.0000098	0.0000109	**0.000101**	0.0000467	0.0000375	0.0000252	0.0000283	0.0000273	0.0000284	**0.000764**	**0.000930**	**0.000917**	**0.0000529**	**0.0000683**	**0.000128**	0.0000088	0.0000119	0.0000078	**0.000137**	0.0000324	0.0000109	0.0000077
Calcium (Ca)-Total	17.4	17.7	17.6	18.6	17.4	17.5	17.7	17.6	17.5	17.4	17.6	17.6	17.5	18.7	18.7	18.6	17.9	18.3	18.6	17.5	17.4	17.7	17.6	17.6	17.5	20.2
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000089	0.0000129	0.0000089	0.0000809	0.0000119	0.0000089	0.0000179	0.0000099	0.0000089	0.0000119	0.0000099	0.0000099	0.0000129	0.0000410	0.0000581	0.0000561	0.0000099	0.0000129	0.0000129	0.0000099	0.0000089	0.0000079	0.0000420	0.0000189	0.0000099	0.000011
Copper (Cu)-Total	0.00030	0.00032	0.00028	0.00401	0.00029	0.00028	0.00037	0.00032	0.00033	0.00037	0.00033	0.00036	0.00041	0.00061	0.00082	0.00084	0.00035	0.00036	0.00046	0.00028	0.00029	0.00030	0.00068	0.00046	0.00028	0.00027
Iron (Fe)-Total	0.0089	0.0080	0.0074	0.0819	0.0089	0.0080	0.0099	0.0078	0.0078	0.0105	0.0092	0.0089	0.0151	0.0109	0.0125	0.0123	0.0097	0.0105	0.0112	0.0093	0.0096	0.0095	0.0570	0.0225	0.0092	0.0114
Lead (Pb)-Total	0.000496	0.0000716	0.000103	0.0160	0.000121	0.000104	0.00108	0.000427	0.000261	0.000194	0.000214	0.000203	0.000244	0.00463	0.00959	0.00944	0.000385	0.000541	0.00158	0.000113	0.000141	0.0000836	0.00311	0.00116	0.000130	0.0000741
Lithium (Li)-Total	0.00090	0.00092	0.00099	0.00112	0.00100	0.00088	0.00094	0.00113	0.00102	0.00092	0.00099	0.00113	0.00104	0.00109	0.00099	0.00108	0.00098	0.00097	0.00105	0.00101	0.00110	0.00098	0.00100	0.00095	0.00100	0.00142
Magnesium (Mg)-Total	3.73	3.75	3.74	3.76	3.72	3.76	3.78	3.76	3.76	3.73	3.75	3.76	3.75	3.78	3.79	3.80	3.77	3.80	3.77	3.79	3.77	3.80	3.82	3.79	3.75	4.75
Manganese (Mn)-Total	0.00136	0.00147	0.00123	0.00583	0.00134	0.00135	0.00174	0.00145	0.00146	0.00156	0.00147	0.00155	0.00167	0.00362	0.00360	0.00379	0.00137	0.00138	0.00144	0.00126	0.00125	0.00129	0.00428	0.00178	0.00130	0.00154
Molybdenum (Mo)-Total	0.000486	0.000476	0.000489	0.000534	0.000508	0.000492	0.000490	0.000595	0.000504	0.000494	0.000507	0.000491	0.000490	0.000564	0.000550	0.000550	0.000513	0.000525	0.000576	0.000509	0.000496	0.000478	0.000495	0.000483	0.000502	0.00048
Nickel (Ni)-Total	0.000337	0.000361	0.000335	0.000706	0.000314	0.000314	0.000338	0.000335	0.000297	0.000330	0.000306	0.000339	0.000404	0.000414	0.000416	0.000440	0.000340	0.000363	0.000373	0.000322	0.000316	0.000321	0.000466	0.00388	0.000326	0.000334
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.621	0.617	0.613	0.685	0.599	0.630	0.629	0.641	0.603	0.614	0.608	0.590	0.662	0.654	0.623	0.630	0.621	0.614	0.629	0.613	0.618	0.642	0.640	0.639	0.596	0.602
Selenium (Se)-Total	0.000150	0.000147	0.000141	0.00115	0.000154	0.000145	0.000310	0.000260	0.000233	0.000154	0.000161	0.000156	0.000179	0.00131	0.00104	0.00101	0.000519	0.000722	0.00122	0.000146	0.000157	0.000148	0.000151	0.000160	0.000140	0.000176
Silicon (Si)-Total	1.56	1.56	1.59	1.62	1.56	1.59	1.59	1.60	1.58	1.56	1.59	1.57	1.57	1.58	1.58	1.59	1.58	1.60	1.58	1.58	1.58	1.60	1.67	1.60	1.58	1.91
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000072	0.0000062	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.17	1.30	1.15	2.78	1.15	1.16	1.43	1.33	1.32	1.19	1.20	1.20	1.22	3.05	2.53	2.48	1.62	1.78	2.45	1.20	1.20	1.19	1.20	1.18	1.20	1.33
Strontium (Sr)-Total	0.0968	0.0969	0.0964	0.0987	0.0972	0.0971	0.0987	0.117	0.0988	0.0979	0.0992	0.0982	0.0987	0.0997	0.0998	0.101	0.0998	0.0992	0.100	0.101	0.0981	0.0983	0.0986	0.0982	0.0982	0.113
Thallium (Tl)-Total	0.0000025	0.0000025	<0.0000020	0.0000352	0.0000025	0.0000025	0.0000093	0.0000083	0.0000054	0.0000034	0.0000044	0.0000044	0.0000034	0.0000374	0.0000277	0.0000277	0.0000073	0.0000092	0.0000228	0.0000024	0.0000034	0.0000024	0.0000092	0.0000044	0.0000024	0.0000029
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	0.000063	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000027	0.000027	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	0.00332	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00060	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00285	0.00099	<0.00050	0.00062
Uranium (U)-Total	0.000385	0.000384	0.000391	0.000415	0.000391	0.000387	0.000392	0.000464	0.000390	0.000393	0.000390	0.000391	0.000394	0.000387	0.000396	0.000394	0.000400	0.000390	0.000390	0.000399	0.000386	0.000379	0.000404	0.000397	0.000387	0.000438
Vanadium (V)-Total	0.000100	0.000119	0.000102	0.000243	0.000107	0.000101	0.000112	0.000105	0.000101	0.000104	0.000110	0.000111	0.000116	0.000126	0.000125	0.000127	0.000117	0.000123	0.000119	0.000108	0.000106	0.000115	0.000199	0.000142	0.000115	0.0001
Zinc (Zn)-Total	0.00143	0.00133	0.00137	0.0301	0.00141	0.00102	0.00265	0.00180	0.00170	0.00124	0.00139	0.00124	0.00130	0.0157	0.0195	0.0197	0.00243	0.00318	0.00597	0.00071	0.00061	0.00174	0.00678	0.00345	0.00140	0.00051
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																										
Dissolved Metals Filtration Location																										
Aluminum (Al)-Dissolved	0.00548	0.00468	0.00522	0.00680	0.00469	0.00503	0.00512	0.00560	0.00530	0.00544	0.00511	0.00467	0.00539	0.00686	0.00656	0.00638	0.00628	0.00619	0.00755	0.00653	0.00537	0.00532	0.00524	0.00559	0.00521	0.00344
Antimony (Sb)-Dissolved	0.000036	0.000027	0.000028	0.00102	0.000030	0.000026	0.000154	0.000094	0.000084	0.000064	0.000063	0.000056	0.000056	0.000919	0.000848	0.000774	0.000530	0.000607	0.000542	0.000034	0.000031	0.000032	0.000144	0.000034	0.000033	0.000031
Arsenic (As)-Dissolved	0.000269	0.000140	0.000157	0.000744	0.000167	0.000148	0.000240	0.000190	0.000192	0.000173	0.000157	0.000169	0.000165	0.000777	0.000767	0.000713	0.000530	0.000562	0.000706	0.000152	0.000162	0.000155	0.00193	0.000321	0.000307	0.000154
Barium (Ba)-Dissolved	0.0163	0.0162	0.0162	0.0165	0.0162	0.0163	0.0164	0.0164	0.0164	0.0166	0.0164	0.0163	0.0161	0.0167	0.0164	0.0166	0.0164	0.0164	0.0202	0.0164	0.0160	0.0164	0.0165	0.0166	0.0167	0.0184
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000053	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	0.0055	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0061	<0.0050	<0.0050	<0.0050	<0.0050	0.0051	0.0052	0.0051	<0.0050	0.0052	<0.0050	0.0055	<0.0050	<0.0050	<0.0050	<0.0050	0.0093
Cadmium (Cd)-Dissolved	0.0000088	<0.0000050	0.0000057	0.000929	<0.0000050	<0.0000050	0.0000774	0.0000344	0.0000293	0.0000197	0.0000212	0.0000253	0.0000191	0.000605	0.000660	0.000640	0.0000601	0.0000693	0.0000867	<0.0000050	0.0000058	0.0000068	0.0000806	0.0000181	0.0000099	<0.0000050
Calcium (Ca)-Dissolved	17.2	17.4	17.2	18.3	17.2	17.1	17.5	17.4	17.1	17.1	17.2	17.3	17.3	18.4	18.3	18.2	18.1	18.0	18.0	17.1	17.5	17.3	17.2	17.3	17.3	19.8
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000069	0.0000059	0.0000059	0.0000329	0.0000059	0.0000059	0.0000069	0.0000059	0.0000059	0.0000059	0.0000059	<0.0000050	<0.0000050	0.0000430	0.0000500	0.0000400	0.0000079	0.0000069	0.0000089	0.0000059	<0.0000050	0.0000059	0.0000069	0.0000069	<0.0000050	<0.0000050
Copper (Cu)-Dissolved	0.00024	0.00022	0.00022	0.00078	0.00022	0.00031	0.00026	0.00024	0.00026	0.00023	0.00024	0.00024	0.00025	0.00042	0.00049	0.00047	0.00025	0.00036	0.00033	0.00022	0.00020	0.00023	0.00027	0.00023	0.00025	0.00020
Iron (Fe)-Dissolved	0.0078	<0.0010	<0.0010	0.0013	<0.0010	0.0011	<0.0010	<0.0010	0.0016	0.0015	<0.0010	<0.0010	0.0010	0.0013	0.0014	0.0015	0.0012	0.0019	0.0013	0.0011	<0.0010	0.0010	0.0012	0.0014	0.0011	<0.0010
Lead (Pb)-Dissolved	0.0000183	0.0000058	0.0000059	0.00249	0.0000079	0.0000099	0.000219	0.0000719	0.0000492	0.0000418	0.0000255	0.0000304	0.0000245	0.00356	0.00482	0.00382	0.000121	0.000193	0.000294	0.0000167	0.0000198	0.0000128	0.0000736	0.0000392	0.0000167	<0.0000050
Lithium (Li)-Dissolved	0.00090	0.00093	0.00091	0.00111	0.00094	0.00093	0.00092	0.00095	0.00100	0.00089	0.00091	0.00097	0.00103	0.00098	0.00100	0.00101	0.00097	0.00104	0.00099	0.00096	0.00101	0.00096	0.00096	0.00089	0.00096	0.00122
Magnesium (Mg)-Dissolved	3.67	3.69	3.67	3.71	3.70	3.69	3.71	3.72	3.66	3.65	3.65	3.68	3.68	3.73	3.74	3.73	3.75	3.72	3.73	3.72	3.78	3.75	3.71	3.72	3.71	4.66
Manganese (Mn)-Dissolved	0.000308	0.000234	0.000217	0.00222	0.000289	0.000273	0.000613	0.000466	0.000441	0.000377	0.000410	0.000385	0.000354	0.00215	0.00204	0.00219	0.000312	0.000364	0.000451	0.000210	0.000220	0.000243	0.000465	0.000230	0.000255	0.000187
Mercury (Hg)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)-Dissolved	0.000490	0.000515	0.000502	0.000578	0.000521	0.000507	0.000526	0.000517	0.000526	0.000491	0.000525	0.000517	0.000530	0.000575	0.000569	0.000563	0.000547	0.000569	0.000562	0.000508	0.000508	0.000504	0.000530	0.000518	0.000514	0.000500
Nickel (Ni)-Dissolved	0.000304	0.000299	0.000309	0.000384	0.000305	0.000319	0.000282	0.000286	0.000322	0.000298	0.000308	0.000291	0.000282	0.000387	0.000387	0.000409	0.000327	0.000332	0.000408	0.000288	0.000271	0.000292	0.000335	0.000313	0.000329	0.000313
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.624	0.600	0.593	0.636	0.605	0.606	0.599	0.610	0.613	0.591	0.587	0.594	0.607	0.637	0.646	0.614	0.630	0.604	0.614	0.585	0.640	0.616	0.605	0.611	0.598	0.581
Selenium (Se)-Dissolved	0.000130	0.000127	0.000125	0.00111	0.000149	0.000128	0.000276	0.000194	0.000198	0.000157	0.000160	0.000164	0.000160	0.00108	0.000943	0.000841	0.000685	0.000803	0.000771	0.000130	0.000126	0.000132	0.000142	0.000127	0.000128	0.000151
Silicon (Si)-Dissolved	1.52	1.51	1.52	1.54	1.52	1.52	1.54	1.55	1.52	1.53	1.53	1.53	1.52	1.54	1.55	1.54	1.54	1.54	1.53	1.55	1.55	1.54	1.58	1.55	1.54	1.84
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.17	1.14	1.12	2.77	1.14	1.14	1.41	1.31	1.30	1.14	1.17	1.20	1.17	2.80	2.47	2.33	1.82	1.99	2.54	1.17	1.11	1.16	1.19	1.17	1.18	1.32
Strontium (Sr)-Dissolved	0.0968	0.0962	0.0973	0.0991	0.0972	0.0985	0.0980	0.0985	0.0995	0.0978	0.0976	0.0981	0.0999	0.100	0.100	0.0998	0.0999	0.102	0.100	0.100	0.0972	0.0986	0.0999	0.0987	0.0993	0.111
Thallium (Tl)-Dissolved	0.0000035	0.0000035	0.0000035	0.0000339	0.0000034	0.0000034	0.0000083	0.0000073	0.0000083	0.0000036	0.0000034	0.0000044	0.0000044	0.0000306	0.0000277	0.0000228	0.0000083	0.0000112	0.0000180	0.0000034	<0.0000020	0.0000034	0.0000053	0.0000024	0.0000034	0.0000026
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000387	0.000388	0.000391	0.000408	0.000393	0.000398	0.000398	0.000402	0.000396	0.000395	0.000396	0.000392	0.000400	0.000398	0.000395	0.000396	0.000389	0.000396	0.000396	0.000394	0.000391	0.000397	0.000396	0.000393	0.000402	0.000423
Vanadium (V)-Dissolved	0.000091	0.000097	0.000093	0.000100	0.000102	0.000096	0.000091	0.000104	0.000097	0.000089	0.000087	0.000092	0.000099	0.000111	0.000097	0.000114	0.000104	0.000112	0.000131	0.000096	0.000098	0.000095	0.000101	0.000093	0.000097	0.000076
Zinc (Zn)-Dissolved	0.00090	0.00082	0.00120	0.0154	0.00089	0.00127	0.00205	0.00146	0.00144	0.00092	0.00078	0.00082	0.00089	0.0145	0.0161	0.0151	0.00282	0.00365	0.00399	0.00053	<0.00050	0.00110	0.00305	0.00080	0.00113	<0.0010
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	BB-G-R-3APR-12	BB-T1-9-APR-12	BB-T1-15APR12	BB-G-R-27 APR 12	BIRCHBANK GRAB	BIRCHBANK GRAB	BB-T1-9-APR-12	BB-T2-9-APR-12	BB-T3-9-APR-12	BB-T4-9-APR-12	BB-T5-9-APR-12	BB-T6-9-APR-12	BB-T1-15APR12	BB-T2-15APR12	BB-T3-15APR12	BB-T4-15APR12	BB-T5-15APR12	BB-T6-15APR12	BB-T1-26JULY-12	BB-T2-26JULY-12	BB-T3-26JULY-12	BB-T4-26JULY-12	BB-T5-26JULY-12	BB-T6-26JULY-12	SC-G-R-28MAR12	SC-G-R-3APR-12	SC-T1-9-APR-12	SC-T1-15APR12	SC-G-R-27 APR 12
Site	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**sc**	**sc**	**sc**	**sc**	**sc**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**
Date Sampled	3-Apr-12	9-Apr-12	15-Apr-12	27-Apr-12	28-MAR-13	09-APR-13	9-Apr-12	9-Apr-12	9-Apr-12	9-Apr-12	9-Apr-12	9-Apr-12	15-Apr-12	15-Apr-12	15-Apr-12	15-Apr-12	15-Apr-12	15-Apr-12	26-Jul-12	26-Jul-12	26-Jul-12	26-Jul-12	26-Jul-12	26-Jul-12	28-MAR-12	03-APR-12	09-APR-12	15-APR-12	27-APR-12
Time Sampled	11:00	11:30	10:30	00:00	11:10	00:00	11:30	11:30	11:30	11:30	11:30	11:30	10:30	10:30	10:30	10:30	10:30	10:30	00:00	00:00	00:00	00:00	00:00	00:00	12:21	11:20	12:30	11:30	00:00
ALS Sample ID	L1131351-1	L1133205-1	L1135488-1	L1140473-1	L1284870-1	L1288829-1	L1133205-1	L1133205-2	L1133205-3	L1133205-4	L1133205-5	L1133205-6	L1135488-1	L1135488-2	L1135488-3	L1135488-4	L1135488-5	L1135488-6	L1185400-1	L1185400-2	L1185400-3	L1185400-4	L1185400-5	L1185400-6	L1129175-2	L1131351-2	L1133205-7	L1135488-7	L1140473-2
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																													
Conductivity	146	152	143	132	143	139	152	150	150	150	150	150	143	143	143	144	144	144	116	116	116	116	116	116	135	145	150	143	129
Hardness (as CaCO3)	73.2	73.6	71.6	65.5	69.4	67.7	73.6	74.7	74.9	74.5	74	74.3	71.6	72.1	72.3	72.4	72.5	73.3	59.1	60	59.2	59.8	59.2	59.5	68	72.7	74.4	72.8	64.3
pH	7.99	8.14	8.05	7.89	8.06	8.05	8.14	8.11	8.12	8.12	8.12	8.13	8.05	8.07	8.06	8.08	8.07	8.08	7.82	7.94	7.97	7.96	7.98	7.99	7.69	7.42	8.11	8.06	6.93
Total Suspended Solids	<3.0	3.3	<3.0	5.3	<3.0	<3.0	3.3	<3.0	<3.0	<3.0	<3.0	4.7	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	8.7
Total Dissolved Solids	79	89	86	72	84	84	89	86	81	87	85	82	86	86	82	86	82	84	74	74	73	73	72	73	79	82	85	86	76
Turbidity	0.42	0.38	0.65	2.34	0.42	0.8	0.38	0.31	0.38	0.42	0.35	0.33	0.65	0.6	0.49	0.7	0.54	0.49	0.94	0.98	0.85	0.82	0.93	0.92	0.53	0.42	0.36	0.76	2.75
Anions and Nutrients																													
Alkalinity, Total (as CaCO3)	68.1	67.1	63.4	66.8	61.2	55	67.1	66.7	66.3	66.5	66.5	66.9	63.4	63.6	63.6	64.2	64.5	64.9	54.8	54.8	55.8	54.2	54.9	55.6	63.1	66.9	67	64.2	68.3
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0053	<0.0050	0.006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0097	<0.0050	<0.0050	0.0064
Bromide (Br)	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010
Chloride (Cl)	**1.01**	**1.01**	**0.95**	**0.88**	**0.8**	**0.86**	**1.01**	**1.01**	**1**	**1**	**1**	**1**	**0.95**	**0.96**	**0.96**	**0.96**	**0.96**	**0.96**	**0.58**	**0.58**	**0.58**	**0.57**	**0.57**	**0.58**	**0.7**	**1.04**	**1.03**	**0.99**	**0.93**
Fluoride (F)	0.07	0.071	0.071	0.073	0.067	0.074	0.071	0.07	0.071	0.071	0.071	0.07	0.071	0.071	0.071	0.072	0.072	0.072	0.065	0.065	0.065	0.065	0.064	0.064	0.062	0.07	0.071	0.072	0.074
Nitrate (as N)	0.152	0.152	0.151	0.144	0.141	0.141	0.152	0.154	0.151	0.152	0.152	0.155	0.151	0.152	0.149	0.152	0.146	0.149	0.0891	0.0889	0.0898	0.0895	0.0896	0.091	0.159	0.154	0.154	0.152	0.146
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	0.0022	0.0018	0.0018	0.0018	0.0057	<0.0010	<0.0010	<0.0010	<0.0010	0.0036
Total Kjeldahl Nitrogen					<0.050	<0.050																							
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	0.003	<0.0020	<0.0020	<0.0020	0.0022	0.002	0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.002	<0.0020	0.003	<0.0020	0.0032	0.0028	<0.0020	<0.0020	<0.0020	<0.0020	0.0021
Phosphorus (P)-Total	0.0038	0.0036	0.0037	0.0111	0.0045	0.0041	0.0036	0.004	0.0039	0.0031	0.0039	0.0037	0.0037	0.004	0.0038	0.0036	0.0044	0.0035	0.0071	0.0059	0.0046	0.0045	0.0043	0.0043	0.0033	0.0045	0.0037	0.0038	0.0099
Sulfate (SO4)	12.1	12.5	12	10.8	11.8	11.1	12.5	12.5	12.5	12.5	12.5	12.5	12	12	12	12	12	12	9.23	9.21	9.24	9.22	9.22	9.21	11.6	12.2	12.7	12.1	10.7
Total Metals																													
Mercury (Hg)-Total	<0.00050	<0.000010	<0.000010	**0.00106**	<0.00050	<0.00057	<0.000010	-	-	-	-	-	<0.000010	-	-	-	-	-	**0.00062**	-	-	-	-	-	**0.00158**	<0.00050	<0.000010	<0.000010	**0.00388**
Total Metals (Undigested)																													
Aluminum (Al)-Total	0.0104	0.00829	0.0108	**0.0724**	0.00964	**0.0225**	0.00829	0.0101	0.00918	0.00947	0.00748	0.0083	0.0108	0.00987	0.0109	0.01	0.0111	0.0112	**0.0271**	**0.036**	**0.0282**	**0.0298**	**0.0265**	**0.0347**	0.0134	0.0127	0.00897	0.0117	**0.106**
Antimony (Sb)-Total	0.000038	0.000036	0.000048	0.00006	0.000049	0.000043	0.000036	0.000038	0.000035	0.000039	0.000043	0.000041	0.000048	0.000046	0.000047	0.000044	0.00004	0.000043	0.000042	0.000041	0.000045	0.000037	0.000036	0.00004	0.000053	0.000061	0.000057	0.000075	0.00022
Arsenic (As)-Total	0.00025	0.000287	0.000263	0.000287	0.000201	0.000228	0.000287	0.000279	0.000275	0.000247	0.000258	0.000263	0.000263	0.000255	0.000269	0.000263	0.000269	0.000261	0.000211	0.000206	0.000224	0.000216	0.000217	0.000206	0.00036	0.000653	0.000521	0.000481	0.000797
Barium (Ba)-Total	0.0221	0.023	0.0224	0.0229	0.02	0.0205	0.023	0.0228	0.023	0.0231	0.0229	0.023	0.0224	0.0229	0.0234	0.0228	0.0223	0.0227	0.0191	0.0197	0.0193	0.0193	0.0187	0.0196	0.019	0.0229	0.0231	0.0231	0.0236
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	0.0063	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0056	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000099	0.0000097	0.0000123	**0.0000294**	0.0000081	0.0000159	0.0000097	0.0000116	0.0000111	0.0000081	0.0000092	0.00001	0.0000123	0.0000126	0.0000171	0.0000105	0.0000107	0.0000117	**0.0000123**	0.0000136	**0.0000115**	**0.0000127**	**0.0000132**	**0.0000126**	**0.0000237**	**0.0000344**	**0.0000274**	**0.0000277**	**0.0000725**
Calcium (Ca)-Total	21.3	22.1	21.2	19.3	19.8	19.5	22.1	21.7	22.3	22.3	22.3	22	21.2	21.3	21.1	21.5	21.2	21.6	17.6	17.7	17.7	17.8	17.5	17.7	20.3	21.5	21.7	21.2	18.8
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00019	<0.00010	<0.00010	<0.00010	<0.00010	0.00024
Cobalt (Co)-Total	0.0000093	0.0000104	0.0000111	0.0000579	0.0000112	0.0000158	0.0000104	0.0000104	0.0000117	0.0000137	0.0000102	0.0000097	0.0000111	0.0000086	0.0000101	0.0000094	0.0000115	0.0000129	0.0000185	0.000036	0.0000167	0.0000219	0.0000199	0.0000331	0.0000115	0.0000099	0.0000153	0.0000097	0.000108
Copper (Cu)-Total	0.00032	0.00031	0.0003	0.00057	0.0003	0.00041	0.00031	0.00032	0.00031	0.00031	0.0003	0.0003	0.0003	0.00035	0.00039	0.0003	0.0003	0.00031	0.00032	0.00032	0.00032	0.00032	0.00031	0.00033	0.00032	0.00035	0.00031	0.00032	0.00062
Iron (Fe)-Total	0.0144	0.0105	0.0124	0.0836	0.0084	0.0187	0.0105	0.013	0.0117	0.0101	0.0089	0.0098	0.0124	0.0148	0.0114	0.0105	0.0116	0.0115	0.0212	0.0361	0.0208	0.0187	0.0177	0.0324	0.0123	0.0151	0.0105	0.013	0.125
Lead (Pb)-Total	0.0000645	0.0000548	0.0000868	0.000265	0.0000553	0.0000675	0.0000548	0.0000822	0.0000772	0.0000958	0.0000644	0.0000554	0.0000868	0.000087	0.0000972	0.0000793	0.0000791	0.0000672	0.000118	0.000146	0.000121	0.000126	0.000115	0.000132	0.00028	0.000168	0.000105	0.000154	0.00212
Lithium (Li)-Total	0.00109	0.0014	0.00107	0.00133	0.00065	0.00086	0.0014	0.00115	0.00115	0.00115	0.00111	0.0011	0.00107	0.00099	0.00124	0.00122	0.00118	0.00124	0.00075	0.00083	0.00073	0.00085	0.0009	0.00074	0.00129	0.00113	0.00105	0.00125	0.00119
Magnesium (Mg)-Total	5.01	5.07	5.04	4.47	4.76	4.6	5.07	5.08	5.11	5.06	5.14	5.08	5.04	5.06	5.06	5.1	5.05	5.07	4.06	4.06	4.03	4.04	4.04	4.08	4.77	5.02	5.13	5.01	4.41
Manganese (Mn)-Total	0.00201	0.00181	0.00175	0.00607	0.00165	0.00236	0.00181	0.002	0.00184	0.00172	0.00165	0.00167	0.00175	0.00172	0.00172	0.00162	0.00166	0.0024	0.00238	0.00277	0.00225	0.0023	0.0021	0.00265	0.00179	0.00233	0.00177	0.00179	0.00758
Molybdenum (Mo)-Total	0.000482	0.0005	0.00055	0.00047	0.000484	0.000527	0.0005	0.000487	0.000501	0.000537	0.000511	0.000523	0.00055	0.000528	0.000545	0.000518	0.000534	0.000534	0.00048	0.000463	0.00047	0.000484	0.000469	0.000454	0.000486	0.000507	0.000512	0.000544	0.000479
Nickel (Ni)-Total	0.000282	0.000333	0.000308	0.000378	0.00034	0.000327	0.000333	0.000335	0.00025	0.000272	0.000277	0.000286	0.000308	0.000291	0.000393	0.000296	0.000282	0.000294	0.000241	0.000294	0.000277	0.000241	0.000211	0.000266	0.000343	0.000277	0.00026	0.000288	0.000429
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.622	0.622	0.62	0.645	0.591	0.68	0.622	0.63	0.634	0.611	0.667	0.622	0.62	0.64	0.637	0.632	0.617	0.613	0.566	0.609	0.551	0.595	0.564	0.591	0.611	0.648	0.663	0.623	0.652
Selenium (Se)-Total	**0.00024**	**0.000269**	**0.00024**	**0.000246**	0.000192	**0.000216**	**0.000269**	**0.000275**	**0.00026**	**0.000276**	**0.000284**	**0.000267**	**0.00024**	**0.000241**	**0.000248**	**0.000246**	**0.000258**	**0.000222**	**0.000237**	**0.000235**	**0.000229**	**0.000239**	**0.000227**	**0.000241**	0.000157	**0.000219**	**0.000274**	**0.000225**	**0.000255**
Silicon (Si)-Total	2.14	2.1	2.15	2.43	1.96	2.35	2.1	2.1	2.12	2.1	2.12	2.1	2.15	2.15	2.15	2.15	2.13	2.14	2.13	2.17	2.14	2.15	2.13	2.16	1.93	2.2	2.16	2.21	2.58
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.75	1.92	1.64	1.59	1.49	1.61	1.92	1.91	1.87	1.86	1.87	1.88	1.64	1.64	1.65	1.67	1.66	1.64	1.22	1.2	1.21	1.22	1.16	1.21	1.35	1.72	1.89	1.68	1.57
Strontium (Sr)-Total	0.0995	0.108	0.106	0.0993	0.109	0.108	0.108	0.103	0.105	0.11	0.109	0.105	0.106	0.104	0.106	0.107	0.105	0.106	0.101	0.102	0.1	0.1	0.102	0.0963	0.112	0.101	0.108	0.106	0.0971
Thallium (Tl)-Total	<0.0000020	0.0000023	0.000002	0.0000033	<0.0000020	<0.0000020	0.0000023	<0.0000020	0.0000021	0.0000021	0.0000022	0.000002	0.000002	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000027	0.0000021	0.0000035	0.0000021	0.0000029	0.0000031	<0.0000020	<0.0000020	<0.0000020	0.0000044
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000082	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000014	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	0.00369	<0.00050	0.00076	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00135	0.00087	0.00053	<0.00050	0.00117	0.00058	<0.00050	<0.00050	<0.00050	0.0073
Uranium (U)-Total	0.000516	0.000518	0.000524	0.000574	0.000474	0.000524	0.000518	0.000508	0.000515	0.000503	0.000513	0.000498	0.000524	0.000533	0.000529	0.000525	0.000527	0.000542	0.000434	0.000447	0.000435	0.00044	0.000427	0.000427	0.000426	0.000494	0.0005	0.000531	0.000557
Vanadium (V)-Total	0.000108	0.000111	0.000122	0.000304	0.000111	0.000091	0.000111	0.000107	0.000117	0.000114	0.000095	0.000109	0.000122	0.000109	0.000118	0.000122	0.000114	0.000116	0.00017	0.000211	0.000187	0.000176	0.000153	0.000196	0.000097	0.000112	0.000118	0.000118	0.0004
Zinc (Zn)-Total	0.00108	0.00113	0.00103	0.00249	0.0007	0.00278	0.00113	0.00152	0.00213	0.00128	0.00122	0.00144	0.00103	0.00229	0.00207	0.00149	0.00128	0.00129	0.00081	0.00091	0.00184	0.00102	0.00122	0.00139	0.00144	0.00246	0.00205	0.00177	0.00443
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																													
Dissolved Metals Filtration Location																													
Aluminum (Al)-Dissolved	0.00315	0.00313	0.00323	0.0106			0.00313	0.00334	0.00365	0.00307	0.00288	0.00299	0.00323	0.00322	0.00365	0.00424	0.00338	0.00400	0.0154	0.0142	0.0165	0.0163	0.0141	0.0150	0.00350	0.00398	0.00342	0.00400	0.0120
Antimony (Sb)-Dissolved	0.000036	0.000040	0.000052	0.000063			0.000040	0.000046	0.000041	0.000041	0.000038	0.000037	0.000052	0.000048	0.000047	0.000039	0.000045	0.000046	0.000040	0.000043	0.000041	0.000039	0.000041	0.000038	0.000044	0.000058	0.000063	0.000062	0.000083
Arsenic (As)-Dissolved	0.000260	0.000268	0.000271	0.000238			0.000268	0.000254	0.000264	0.000270	0.000259	0.000280	0.000271	0.000263	0.000262	0.000252	0.000257	0.000240	0.000212	0.000227	0.000204	0.000194	0.000193	0.000201	0.000338	0.000621	0.000458	0.000442	0.000416
Barium (Ba)-Dissolved	0.0216	0.0224	0.0221	0.0208			0.0224	0.0225	0.0224	0.0224	0.0224	0.0228	0.0221	0.0216	0.0216	0.0216	0.0221	0.0216	0.0188	0.0190	0.0186	0.0188	0.0189	0.0190	0.0187	0.0214	0.0225	0.0220	0.0204
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000082	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	0.0108	<0.0050	<0.0050	<0.0050			<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0116	0.0083	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000081	0.0000086	0.0000066	0.0000102			0.0000086	0.0000083	0.0000064	0.0000069	0.0000086	0.0000077	0.0000066	0.0000090	0.0000079	0.0000095	0.0000118	0.0000074	0.0000061	0.0000069	0.0000090	0.0000065	0.0000092	0.0000076	0.0000159	0.0000237	0.0000244	0.0000215	0.0000239
Calcium (Ca)-Dissolved	21.2	21.3	20.6	19.0			21.3	21.6	21.7	21.6	21.4	21.5	20.6	20.7	20.8	20.8	20.9	21.1	17.2	17.4	17.2	17.4	17.1	17.3	19.6	21.0	21.6	21.1	18.6
Chromium (Cr)-Dissolved	0.00011	<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000077	0.0000066	<0.0000050	0.0000100			0.0000066	0.0000051	0.0000059	0.0000061	0.0000069	<0.0000050	<0.0000050	0.0000050	0.0000057	0.0000054	<0.0000050	0.0000063	0.0000091	0.0000057	0.0000082	0.0000078	0.0000086	0.0000072	<0.0000050	0.0000067	0.0000072	0.0000065	0.0000073
Copper (Cu)-Dissolved	0.00026	0.00024	0.00024	0.00045			0.00024	0.00027	0.00026	0.00027	0.00033	0.00029	0.00024	0.00025	0.00025	0.00024	0.00024	0.00025	0.00034	0.00028	0.00028	0.00032	0.00030	0.00027	0.00022	0.00028	0.00025	0.00025	0.00031
Iron (Fe)-Dissolved	0.0016	0.0013	0.0014	0.0044			0.0013	0.0012	0.0011	0.0012	0.0012	0.0012	0.0014	0.0014	0.0013	0.0014	0.0016	0.0015	0.0018	0.0018	0.0034	0.0021	0.0023	0.0018	<0.0010	0.004	0.0012	0.0015	0.0045
Lead (Pb)-Dissolved	<0.0000050	0.0000064	0.0000078	0.0000105			0.0000064	0.0000087	0.0000064	0.0000224	0.0000258	0.0000167	0.0000078	0.0000090	0.0000097	0.0000206	0.0000075	0.0000109	0.0000122	0.0000074	0.0000154	0.0000123	0.0000110	0.0000092	0.0000199	0.0000199	0.0000090	0.0000258	0.0000360
Lithium (Li)-Dissolved	0.00139	0.00125	0.00108	0.00103			0.00125	0.00119	0.00113	0.00117	0.00107	0.00114	0.00108	0.00125	0.00122	0.00100	0.00119	0.00127	0.00075	0.00101	0.00113	0.00089	0.00104	0.00081	0.00132	0.00109	0.00104	0.00113	0.00103
Magnesium (Mg)-Dissolved	4.96	5.00	4.89	4.38			5.00	5.03	5.04	4.99	5.03	4.97	4.89	4.95	4.94	4.98	4.94	4.99	3.94	4.00	3.93	4.00	3.98	3.98	4.61	4.92	4.99	4.91	4.33
Manganese (Mn)-Dissolved	0.00082	0.000480	0.000456	0.00083			0.000480	0.000507	0.000507	0.000477	0.000455	0.000474	0.000456	0.000444	0.000449	0.000471	0.000434	0.000712	0.000290	0.000125	0.000123	0.000141	0.000141	0.000135	0.000292	0.00110	0.000535	0.000488	0.00088
Mercury (Hg)-Dissolved	<0.00050	<0.000010	<0.000010	<0.00050			<0.000010	-	-	-	-	-	<0.000010	-	-	-	-	-	<0.00050	-	-	-	-	-	<0.000010	<0.00050	<0.000010	<0.000010	<0.00050
Molybdenum (Mo)-Dissolved	0.000549	0.000559	0.000549	0.000514			0.000559	0.000544	0.000545	0.000551	0.000553	0.000545	0.000549	0.000554	0.000545	0.000471	0.000588	0.000578	0.000487	0.000501	0.000506	0.000503	0.000537	0.000486	0.000496	0.000520	0.000553	0.000547	0.000541
Nickel (Ni)-Dissolved	0.000293	0.000254	0.000251	0.000260			0.000254	0.000244	0.000244	0.000256	0.000269	0.000284	0.000251	0.000269	0.000252	0.000273	0.000251	0.000253	0.000238	0.000243	0.000267	0.000259	0.000245	0.000235	0.000322	0.000252	0.000240	0.000260	0.000243
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.602	0.616	0.608	0.599			0.616	0.641	0.640	0.625	0.622	0.610	0.608	0.606	0.612	0.595	0.597	0.612	0.563	0.564	0.558	0.570	0.564	0.556	0.602	0.634	0.624	0.614	0.624
Selenium (Se)-Dissolved	0.000216	0.000226	0.000223	0.000257			0.000226	0.000243	0.000238	0.000231	0.000226	0.000234	0.000223	0.000223	0.000210	0.000213	0.000194	0.000228	0.000212	0.000226	0.000242	0.000206	0.000226	0.000229	0.000164	0.000202	0.000233	0.000216	0.000211
Silicon (Si)-Dissolved	2.07	2.03	2.06	2.25			2.03	2.04	2.04	2.03	2.03	2.03	2.06	2.06	2.07	2.08	2.06	2.08	2.07	2.09	2.07	2.10	2.08	2.08	1.83	2.14	2.12	2.14	2.35
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.76	1.89	1.63	1.58			1.89	1.89	1.87	1.86	1.87	1.87	1.63	1.64	1.66	1.64	1.69	1.67	1.21	1.24	1.20	1.23	1.20	1.21	1.34	1.76	1.88	1.68	1.55
Strontium (Sr)-Dissolved	0.110	0.107	0.106	0.0997			0.107	0.108	0.110	0.112	0.109	0.110	0.106	0.106	0.106	0.089	0.104	0.107	0.099	0.104	0.106	0.102	0.1050	0.100	0.112	0.101	0.109	0.103	0.0983
Thallium (Tl)-Dissolved	<0.0000020	0.0000021	<0.0000020	<0.0000020			0.0000021	<0.0000020	<0.0000020	0.0000024	0.0000021	0.0000026	<0.0000020	0.0000025	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000021	0.0000022	0.0000052	0.0000027	0.0000036	0.0000025	0.0000033	0.0000057	0.0000021	0.0000021	0.0000020
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000532	0.000527	0.000542	0.000546			0.000527	0.000534	0.000523	0.000545	0.000519	0.000525	0.000542	0.000530	0.000535	0.000462	0.000538	0.000546	0.000449	0.000437	0.000442	0.000447	0.000428	0.000433	0.000456	0.000512	0.000522	0.000536	0.000541
Vanadium (V)-Dissolved	0.000097	0.000097	0.000076	0.000158			0.000097	0.000102	0.000108	0.000095	0.000105	0.000099	0.000076	0.000094	0.000107	0.000092	0.000111	0.000115	0.000150	0.000149	0.000138	0.000142	0.000143	0.000147	0.000089	0.000094	0.000101	0.000103	0.000144
Zinc (Zn)-Dissolved	0.00097	0.00070	0.00073	0.00086			0.00070	0.00125	0.00158	0.00132	0.00096	0.00101	0.00073	0.00157	0.00115	0.00109	0.00087	0.00077	0.00071	0.00078	0.00122	0.00072	0.00075	0.00083	<0.0015	0.00206	0.00165	0.00125	0.00128
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	STONEY CREEK GRAB	STONEY CREEK GRAB	SC-T1-9-APR-12	SC-T2-9-APR-12	SC-T3-9-APR-12	SC-T4-9-APR-12	SC-T5-9-APR-12	SC-T6-9-APR-12
Site	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**
TTS_Dist_CII	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**
Date Sampled	28-MAR-13	09-APR-13	09-APR-12	09-APR-12	09-APR-12	09-APR-12	09-APR-12	09-APR-12
Time Sampled	12:05	00:00	12:30	12:30	12:30	12:30	12:30	12:30
ALS Sample ID	L1284870-2	L1288829-2	L1133205-7	L1133205-8	L1133205-9	L1133205-10	L1133205-11	L1133205-12
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	143	137	150	150	150	151	151	148
Hardness (as CaCO3)	69.1	66.9	74.4	73.4	74.9	75.3	72.9	73.5
pH	8.05	8.03	8.11	8.1	8.12	8.14	8.15	8.11
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	84	82	85	87	87	84	85	80
Turbidity	0.37	1.08	0.36	0.41	0.32	0.31	0.44	0.32
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	66.5	53.6	67	67.5	66.7	67.5	67.5	65.7
Ammonia, Total (as N)	**0.0158**	0.009	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Bromide (Br)	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	**0.84**	**0.9**	**1.03**	**1.01**	**1.01**	**1**	**1**	**1.01**
Fluoride (F)	0.068	0.074	0.071	0.07	0.071	0.071	0.071	0.071
Nitrate (as N)	0.143	0.141	0.154	0.155	0.154	0.154	0.152	0.153
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.066	0.077						
Phosphorus (P)-Total Dissolved	0.0025	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0028	0.0071	0.0037	0.0034	0.0034	0.0039	0.003	0.0032
Sulfate (SO4)	11.9	11.1	12.7	12.5	12.5	12.5	12.5	12.6
Total Metals								
Mercury (Hg)-Total	<0.0010	<0.0012	<0.000010	-	-	-	-	-
Total Metals (Undigested)								
Aluminum (Al)-Total	0.0106	**0.0235**	0.00897	0.00884	0.00939	0.00961	0.0112	0.01
Antimony (Sb)-Total	0.000071	0.000097	0.000057	0.000325	0.000066	0.000041	0.000047	0.000038
Arsenic (As)-Total	0.000624	0.000522	0.000521	0.000287	0.000273	0.000271	0.000267	0.00029
Barium (Ba)-Total	0.0201	0.0204	0.0231	0.0233	0.0231	0.0228	0.0229	0.0228
Beryllium (Be)-Total	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.0000338**	**0.0000357**	**0.0000274**	0.000019	0.000016	0.0000102	0.0000133	0.0000113
Calcium (Ca)-Total	20.1	19	21.7	22.1	21.9	21.8	21.6	21.5
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000098	0.0000176	0.0000153	0.0000124	0.0000145	0.0000132	0.0000138	0.0000116
Copper (Cu)-Total	0.00029	0.0004	0.00031	0.00034	0.00031	0.00032	0.00032	0.00031
Iron (Fe)-Total	0.0064	0.0219	0.0105	0.0105	0.0106	0.0102	0.0136	0.011
Lead (Pb)-Total	0.0000583	0.000174	0.000105	**0.00368**	0.00029	0.0000883	0.000147	0.0000589
Lithium (Li)-Total	0.00072	0.00085	0.00105	0.00126	0.00114	0.00125	0.00106	0.00107
Magnesium (Mg)-Total	4.79	4.45	5.13	5.16	5.17	5.17	5.09	5.09
Manganese (Mn)-Total	0.00157	0.00229	0.00177	0.00168	0.00178	0.00176	0.00189	0.00181
Molybdenum (Mo)-Total	0.000522	0.000526	0.000512	0.000514	0.000512	0.000567	0.000509	0.00052
Nickel (Ni)-Total	0.000323	0.00031	0.00026	0.000252	0.00026	0.000663	0.000288	0.0003
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.6	0.684	0.663	0.651	0.658	0.631	0.658	0.643
Selenium (Se)-Total	**0.000207**	**0.000201**	**0.000274**	**0.000279**	**0.000263**	**0.000258**	**0.000275**	**0.000272**
Silicon (Si)-Total	2.04	2.46	2.16	2.14	2.13	2.1	2.08	2.06
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.48	1.65	1.89	1.92	1.94	1.94	1.93	1.93
Strontium (Sr)-Total	0.109	0.104	0.108	0.11	0.111	0.111	0.106	0.112
Thallium (Tl)-Total	0.0000036	<0.0000020	<0.0000020	0.0000026	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Tin (Sn)-Total	<0.000010	0.000016	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	0.00088	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050
Uranium (U)-Total	0.000481	0.000509	0.0005	0.00052	0.000506	0.00053	0.000504	0.000526
Vanadium (V)-Total	0.000116	0.000119	0.000118	0.000121	0.000119	0.000126	0.000115	0.000122
Zinc (Zn)-Total	0.00221	0.00332	0.00205	0.00158	0.00152	0.00131	0.00115	0.00096
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location								
Aluminum (Al)-Dissolved			0.00342	0.00331	0.00319	0.00871	0.00287	0.00339
Antimony (Sb)-Dissolved			0.000063	0.000188	0.000056	0.000038	0.000044	0.000036
Arsenic (As)-Dissolved			0.000458	0.000258	0.000250	0.000251	0.000251	0.000271
Barium (Ba)-Dissolved			0.0225	0.0227	0.0226	0.0226	0.0222	0.0221
Beryllium (Be)-Dissolved			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved			0.0083	<0.0050	<0.0050	<0.0050	<0.0050	0.0053
Cadmium (Cd)-Dissolved			0.0000244	0.0000120	0.0000088	0.0000102	0.0000074	0.0000091
Calcium (Ca)-Dissolved			21.6	21.1	21.6	21.7	21.0	21.0
Chromium (Cr)-Dissolved			<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved			0.0000072	0.000006	<0.0000050	0.0000121	0.0000057	0.0000069
Copper (Cu)-Dissolved			0.00025	0.00027	0.00026	0.00030	0.00031	0.00042
Iron (Fe)-Dissolved			0.0012	0.0013	0.0012	0.0099	0.0012	0.0013
Lead (Pb)-Dissolved			0.0000090	0.0004390	0.0000347	0.0000715	0.0000083	0.0000184
Lithium (Li)-Dissolved			0.00104	0.00117	0.00109	0.00140	0.00109	0.00106
Magnesium (Mg)-Dissolved			4.99	5.05	5.06	5.13	4.95	5.11
Manganese (Mn)-Dissolved			0.000535	0.000692	0.000478	0.001740	0.000428	0.000455
Mercury (Hg)-Dissolved			<0.000010	-	-	-	-	-
Molybdenum (Mo)-Dissolved			0.000553	0.000544	0.000538	0.000543	0.000563	0.000543
Nickel (Ni)-Dissolved			0.000240	0.000265	0.000251	0.000238	0.000260	0.000267
Phosphorus (P)-Dissolved			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved			0.624	0.647	0.620	0.629	0.622	0.681
Selenium (Se)-Dissolved			0.000233	0.000242	0.000254	0.000247	0.000241	0.000224
Silicon (Si)-Dissolved			2.12	2.05	2.07	2.06	1.99	2.03
Silver (Ag)-Dissolved			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved			1.88	1.91	1.90	1.85	1.92	1.93
Strontium (Sr)-Dissolved			0.109	0.109	0.110	0.110	0.111	0.112
Thallium (Tl)-Dissolved			0.0000021	0.0000020	0.0000025	<0.0000020	0.0000021	<0.0000020
Tin (Sn)-Dissolved			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved			0.000522	0.000528	0.000529	0.000512	0.000537	0.000545
Vanadium (V)-Dissolved			0.000101	0.000091	0.000098	0.000122	0.000089	0.000098
Zinc (Zn)-Dissolved			0.00165	0.00110	0.00107	0.00116	0.00074	0.00084
Zirconium (Zr)-Dissolved			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	SC-T1-15APR12	SC-T2-15APR12	SC-T3-15APR12	SC-T4-15APR12	SC-T5-15APR12	SC-T6-15APR12	SC-T1-26JULY-12	SC-T2-26JULY-12
Site	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**
TTS_Dist_CII	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**
Date Sampled	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	26-JUL-12	26-JUL-12
Time Sampled	11:30	11:30	11:30	11:30	11:30	11:30	00:00	00:00
ALS Sample ID	L1135488-7	L1135488-8	L1135488-9	L1135488-10	L1135488-11	L1135488-12	L1185400-7	L1185400-8
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	143	145	145	144	144	144	116	117
Hardness (as CaCO3)	72.8	72.4	72.7	71.5	71.8	70.8	59.2	59.5
pH	8.06	8.06	8.1	8.08	8.09	8.1	8	8
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3
Total Dissolved Solids	86	86	86	89	86	85	70	71
Turbidity	0.76	1.07	0.65	1.02	0.7	0.53	0.91	0.91
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	64.2	64.9	65.6	65.1	65.7	65.2	55.1	55
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0053	<0.0050
Bromide (Br)	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050
Chloride (Cl)	**0.99**	**0.96**	**0.96**	**0.96**	**0.96**	**0.96**	**0.58**	**0.58**
Fluoride (F)	0.072	0.072	0.072	0.072	0.072	0.072	0.064	0.064
Nitrate (as N)	0.152	0.154	0.149	0.15	0.151	0.153	0.0901	0.0893
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	0.0044
Total Kjeldahl Nitrogen								
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0026
Phosphorus (P)-Total	0.0038	0.0037	0.0042	0.0039	0.0039	0.0041	0.0043	0.0041
Sulfate (SO4)	12.1	12	12	12	12	12	9.26	9.24
Total Metals								
Mercury (Hg)-Total	<0.000010	-	-	-	-	-	**0.00081**	-
Total Metals (Undigested)								
Aluminum (Al)-Total	0.0117	0.00973	0.0104	0.0103	0.0103	0.00948	**0.0309**	**0.0318**
Antimony (Sb)-Total	0.000075	0.000044	0.000043	0.000043	0.000041	0.000045	0.000041	0.000038
Arsenic (As)-Total	0.000481	0.000273	0.00026	0.000271	0.000268	0.000275	0.000273	0.00022
Barium (Ba)-Total	0.0231	0.0216	0.0226	0.0224	0.0225	0.0223	0.0186	0.0193
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.0000277**	0.0000129	0.0000128	0.0000116	0.0000123	0.0000108	**0.0000153**	**0.0000127**
Calcium (Ca)-Total	21.2	21.6	21.4	21	21.1	20.9	17.7	17.6
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000097	0.0000094	0.000012	0.0000096	0.0000085	0.0000119	0.0000247	0.0000243
Copper (Cu)-Total	0.00032	0.00029	0.0003	0.00028	0.00028	0.00029	0.00031	0.00031
Iron (Fe)-Total	0.013	0.0088	0.0105	0.0104	0.0099	0.0108	0.0252	0.0242
Lead (Pb)-Total	0.000154	0.0000787	0.0000904	0.0000659	0.0000723	0.0000601	0.000175	0.000127
Lithium (Li)-Total	0.00125	0.00118	0.00124	0.00128	0.00115	0.00121	0.00068	0.00074
Magnesium (Mg)-Total	5.01	5.07	5.02	4.99	5.02	5	4.1	4.1
Manganese (Mn)-Total	0.00179	0.00145	0.00163	0.00163	0.0016	0.00162	0.00258	0.00251
Molybdenum (Mo)-Total	0.000544	0.000523	0.000534	0.000525	0.000537	0.000521	0.000441	0.00045
Nickel (Ni)-Total	0.000288	0.000287	0.000281	0.00028	0.000258	0.000262	0.000259	0.000229
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.623	0.631	0.628	0.616	0.624	0.645	0.581	0.572
Selenium (Se)-Total	**0.000225**	**0.00025**	**0.00024**	**0.000257**	**0.000229**	**0.00024**	**0.000226**	**0.00024**
Silicon (Si)-Total	2.21	2.17	2.14	2.12	2.13	2.12	2.19	2.2
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.68	1.63	1.65	1.65	1.63	1.64	1.18	1.2
Strontium (Sr)-Total	0.106	0.104	0.106	0.107	0.105	0.105	0.0966	0.0969
Thallium (Tl)-Total	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000027	<0.0000020
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00103	0.00112
Uranium (U)-Total	0.000531	0.000516	0.00053	0.000531	0.000527	0.000532	0.000415	0.000427
Vanadium (V)-Total	0.000118	0.000119	0.000104	0.000101	0.000104	0.000104	0.000194	0.000196
Zinc (Zn)-Total	0.00177	0.00121	0.00149	0.00115	0.0011	0.0009	0.00115	0.00078
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location								
Aluminum (Al)-Dissolved	0.00400	0.00340	0.00332	0.00302	0.00316	0.00336	0.0143	0.0151
Antimony (Sb)-Dissolved	0.000062	0.000048	0.000047	0.000045	0.000040	0.000043	0.000043	0.000038
Arsenic (As)-Dissolved	0.000442	0.000254	0.000255	0.000235	0.000242	0.000252	0.000207	0.000205
Barium (Ba)-Dissolved	0.0220	0.0220	0.0215	0.0218	0.0213	0.0217	0.0191	0.0186
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000215	0.0000080	0.0000086	0.0000084	0.0000059	0.0000065	0.0000085	0.0000061
Calcium (Ca)-Dissolved	21.1	20.9	21.0	20.6	20.7	20.3	17.1	17.2
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000065	0.0000063	0.0000073	0.0000055	0.0000060	0.0000072	0.0000075	0.0000085
Copper (Cu)-Dissolved	0.00025	0.00023	0.00026	0.00023	0.00025	0.00024	0.00029	0.00033
Iron (Fe)-Dissolved	0.0015	0.0020	0.0016	0.0015	0.0013	0.0014	0.0017	0.0018
Lead (Pb)-Dissolved	0.0000258	0.0000166	0.0000130	0.0000134	0.0000104	0.0000066	0.0000098	0.0000071
Lithium (Li)-Dissolved	0.00113	0.00118	0.00109	0.00116	0.00117	0.00126	0.00073	0.00083
Magnesium (Mg)-Dissolved	4.91	4.91	4.94	4.86	4.92	4.89	4.00	4.02
Manganese (Mn)-Dissolved	0.000488	0.000449	0.000415	0.000449	0.000457	0.000431	0.000126	0.000099
Mercury (Hg)-Dissolved	<0.000010	-	-	-	-	-	<0.00050	-
Molybdenum (Mo)-Dissolved	0.000547	0.000589	0.000562	0.000554	0.000553	0.000533	0.000485	0.000482
Nickel (Ni)-Dissolved	0.000260	0.000356	0.000235	0.000248	0.000259	0.000243	0.000227	0.000245
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.614	0.583	0.583	0.607	0.585	0.612	0.537	0.553
Selenium (Se)-Dissolved	0.000216	0.000198	0.000227	0.000218	0.000230	0.000221	0.000215	0.000200
Silicon (Si)-Dissolved	2.14	2.05	2.08	2.04	2.05	2.07	2.10	2.10
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.68	1.63	1.62	1.62	1.65	1.64	1.27	1.22
Strontium (Sr)-Dissolved	0.103	0.105	0.104	0.104	0.104	0.098	0.101	0.098
Thallium (Tl)-Dissolved	0.0000021	<0.0000020	0.0000022	0.0000020	<0.0000020	<0.0000020	0.0000026	<0.0000020
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000536	0.000546	0.000537	0.000544	0.000546	0.000509	0.000433	0.000432
Vanadium (V)-Dissolved	0.000103	0.000105	0.000103	0.000094	0.000096	0.000104	0.000136	0.000145
Zinc (Zn)-Dissolved	0.00125	0.00091	0.00095	0.00093	0.00081	0.00072	0.00096	0.00078
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	SC-T3-26JULY-12	SC-T4-26JULY-12	SC-T5-26JULY-12	SC-T6-26JULY-12	NB-G-R-28MAR12	NB-G-R-3APR-12	NB-T1-9-APR-12	NB-T1-15-APR12	NB-G-R-27 APR 12	NEW BRIDGE GRAB	NEW BRIDGE GRAB
Site	**sc**	**sc**	**sc**	**sc**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**
Sample	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**-1975**	**-1975**	**-1975**	**-1975**	**230**	**230**	**230**	**230**	**230**	**230**	**230**
Date Sampled	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	28-MAR-12	03-APR-12	09-APR-12	15-APR-12	27-APR-12	28-MAR-13	09-APR-13
Time Sampled	00:00	00:00	00:00	00:00	12:34	11:40	13:30	12:30	00:00	14:16	00:00
ALS Sample ID	L1185400-9	L1185400-10	L1185400-11	L1185400-12	L1129175-3	L1131351-3	L1133205-13	L1135488-13	L1140473-3	L1284870-3	L1288829-3
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests											
Conductivity	117	117	117	117	140	150	159	151	133	164	156
Hardness (as CaCO3)	59.9	59.7	59.8	60.4	70.9	74.8	73.6	72.6	65.3	72.9	68.6
pH	8.01	8.01	8.01	8	7.71	7.41	8.1	8.07	6.95	8.05	7.83
Total Suspended Solids	<3.0	3.7	<3.0	3	<3.0	<3.0	<3.0	<3.0	6	<3.0	<3.0
Total Dissolved Solids	67	69	70	72	83	79	93	88	86	98	101
Turbidity	0.97	0.97	0.99	0.95	0.43	0.51	0.43	0.37	2.11	0.53	0.79
Anions and Nutrients											
Alkalinity, Total (as CaCO3)	55.5	55.6	55.1	55.3	62.7	66.8	65.5	65.1	68.4	62.3	54.5
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	0.0093	0.0148	**0.0283**	**0.0212**	0.0059	**0.0717**	**0.0425**
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	0.014	<0.010	<0.010	<0.050	<0.050
Chloride (Cl)	**0.58**	**0.58**	**0.58**	**0.58**	**0.75**	**1.07**	**1.12**	**1.09**	**0.94**	**1.46**	**1.2**
Fluoride (F)	0.064	0.064	0.065	0.064	0.077	0.085	0.109	0.091	0.082	0.135	0.168
Nitrate (as N)	0.0896	0.0899	0.0898	0.0896	0.162	0.16	0.165	0.161	0.146	0.158	0.164
Nitrite (as N)	0.0022	0.0023	0.0021	0.0019	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen										0.091	0.094
Phosphorus (P)-Total Dissolved	0.0029	0.0034	0.0026	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0024	<0.0020	<0.0020
Phosphorus (P)-Total	0.0058	0.0044	0.0044	0.005	0.0036	0.004	0.0035	0.0039	0.0077	0.0033	0.0056
Sulfate (SO4)	9.24	9.26	9.23	9.23	13.7	13.8	17.1	15.2	12	19.7	20.2
Total Metals											
Mercury (Hg)-Total	-	-	-	-	**0.00071**	**0.00122**	<0.000010	<0.000010	**0.00198**	<0.0060	<0.0033
Total Metals (Undigested)											
Aluminum (Al)-Total	**0.0249**	**0.0296**	**0.0308**	**0.0373**	0.0128	0.0106	0.00932	0.012	**0.0786**	0.0103	0.0199
Antimony (Sb)-Total	0.000035	0.000036	0.000037	0.000038	0.000229	0.000249	0.000356	0.000241	0.000169	0.00136	0.000285
Arsenic (As)-Total	0.000215	0.000197	0.000186	0.000208	0.000253	0.000662	0.000669	0.000405	0.000391	0.000847	0.00046
Barium (Ba)-Total	0.0193	0.0193	0.0201	0.0194	0.0194	0.0219	0.0231	0.0222	0.0226	0.0203	0.021
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000163	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0051	<0.0050	<0.0050	<0.0050	0.0057	<0.0050
Cadmium (Cd)-Total	**0.000013**	**0.0000126**	**0.0000115**	0.0000136	**0.0000485**	**0.0000798**	**0.000566**	**0.000439**	**0.0000514**	**0.000947**	**0.000797**
Calcium (Ca)-Total	17.5	17.5	17.7	17.7	20.7	21.7	21.7	21.3	19.4	21.5	20.2
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000211	0.0000246	0.0000226	0.0000286	0.0000111	0.0000126	0.0000139	0.0000184	0.0000682	0.0000279	0.0000303
Copper (Cu)-Total	0.00031	0.00032	0.00036	0.00035	0.0003	0.00032	0.00082	0.00055	0.00053	0.00076	0.00069
Iron (Fe)-Total	0.0172	0.0236	0.0249	0.0346	0.0112	0.0116	0.0125	0.0125	0.0928	0.0067	0.0194
Lead (Pb)-Total	0.000121	0.000138	0.000133	0.000165	0.000176	0.000149	**0.00353**	0.000422	0.000663	0.00186	0.00164
Lithium (Li)-Total	0.00068	0.0008	0.00083	0.00093	0.00127	0.00116	0.00133	0.00129	0.00119	0.00087	0.00096
Magnesium (Mg)-Total	4.04	4.09	4.11	4.14	4.86	5.03	5.06	4.97	4.44	4.86	4.51
Manganese (Mn)-Total	0.00221	0.00234	0.0028	0.00283	0.00199	0.00266	0.00384	0.00318	0.00647	0.00387	0.00477
Molybdenum (Mo)-Total	0.000443	0.00046	0.000469	0.000492	0.000479	0.000555	0.000619	0.000562	0.000485	0.00118	0.00061
Nickel (Ni)-Total	0.00025	0.000242	0.000301	0.000299	0.000342	0.00029	0.000324	0.000288	0.000366	0.000346	0.000295
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.59	0.577	0.572	0.592	0.666	0.674	0.73	0.644	0.635	0.745	0.809
Selenium (Se)-Total	**0.000224**	**0.000229**	**0.000242**	**0.000256**	**0.000251**	**0.000519**	**0.00057**	**0.000341**	**0.000319**	**0.00228**	**0.00127**
Silicon (Si)-Total	2.14	2.15	2.18	2.21	1.88	2.15	2.08	2.15	2.45	2.02	2.41
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.2	1.2	1.2	1.2	1.6	2.08	3.06	2.45	1.84	4.63	4.26
Strontium (Sr)-Total	0.0977	0.0989	0.0976	0.102	0.113	0.102	0.111	0.106	0.101	0.112	0.111
Thallium (Tl)-Total	0.0000022	0.0000025	0.0000025	0.0000034	0.0000774	0.0000783	0.000129	0.000779	0.0000923	**0.00106**	0.000296
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000018	<0.000010	<0.000010	<0.000010	0.000023
Titanium (Ti)-Total	<0.00050	0.00088	0.00114	0.00248	<0.00050	<0.00050	<0.00050	<0.00050	0.00731	<0.00050	0.00075
Uranium (U)-Total	0.000422	0.000427	0.000426	0.000455	0.000449	0.000513	0.000531	0.000534	0.000582	0.000499	0.000512
Vanadium (V)-Total	0.000162	0.000168	0.000184	0.000193	0.000103	0.000107	0.000114	0.000105	0.000343	0.000106	0.00012
Zinc (Zn)-Total	0.00125	0.00175	0.00137	0.00099	0.0016	0.0024	**0.00861**	0.0064	0.00316	**0.0118**	**0.0106**
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals											
Dissolved Metals Filtration Location											
Aluminum (Al)-Dissolved	0.0137	0.0136	0.0141	0.0162	0.00340	0.00360	0.00359	0.00416	0.0112		
Antimony (Sb)-Dissolved	0.000037	0.000034	0.000040	0.000041	0.000310	0.000526	0.000341	0.000233	0.000158		
Arsenic (As)-Dissolved	0.000198	0.000192	0.000200	0.000193	0.000264	0.000791	0.000525	0.000400	0.000310		
Barium (Ba)-Dissolved	0.0188	0.0174	0.0188	0.0194	0.0196	0.0213	0.0227	0.0219	0.0207		
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050		
Boron (B)-Dissolved	<0.0050	<0.0050	0.0070	<0.0050	0.0066	0.0116	<0.0050	<0.0050	<0.0050		
Cadmium (Cd)-Dissolved	0.0000088	0.0000073	0.0000069	0.0000079	0.0000634	0.0001560	0.0004970	0.0004160	0.0000293		
Calcium (Ca)-Dissolved	17.3	17.2	17.3	17.4	20.5	21.8	21.3	21.0	19.0		
Chromium (Cr)-Dissolved	<0.00010	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010		
Cobalt (Co)-Dissolved	0.0000070	0.0000054	0.0000067	0.0000088	<0.0000050	0.0000101	0.0000162	0.0000126	0.0000125		
Copper (Cu)-Dissolved	0.00027	0.00025	0.00035	0.00040	0.00026	0.00033	0.00060	0.00041	0.00032		
Iron (Fe)-Dissolved	0.0020	0.0015	0.0014	0.0016	<0.0010	0.003	0.0013	0.0015	0.0048		
Lead (Pb)-Dissolved	0.0000099	0.0000073	0.0000094	0.0000091	0.0000166	0.0000490	0.0013000	0.0001030	0.0000256		
Lithium (Li)-Dissolved	0.00086	0.00078	0.00092	0.00094	0.00096	0.00103	0.00127	0.00135	0.00106		
Magnesium (Mg)-Dissolved	4.04	4.03	4.04	4.08	4.78	4.96	4.94	4.90	4.37		
Manganese (Mn)-Dissolved	0.000068	0.000059	0.00019	0.000155	0.000420	0.00223	0.002770	0.002060	0.00095		
Mercury (Hg)-Dissolved	-	-	-	-	<0.000010	<0.00050	<0.000010	<0.000010	<0.00050		
Molybdenum (Mo)-Dissolved	0.000476	0.000475	0.000514	0.000503	0.000513	0.000620	0.000636	0.000588	0.000552		
Nickel (Ni)-Dissolved	0.000221	0.000215	0.000290	0.000300	0.000310	0.000316	0.000295	0.000271	0.000297		
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050		
Potassium (K)-Dissolved	0.547	0.542	0.550	0.561	0.655	0.632	0.679	0.597	0.614		
Selenium (Se)-Dissolved	0.000226	0.000206	0.000232	0.000237	0.000270	0.000625	0.000503	0.000337	0.000269		
Silicon (Si)-Dissolved	2.10	2.11	2.09	2.11	1.84	2.10	2.03	2.10	2.29		
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050		
Sodium (Na)-Dissolved	1.21	1.10	1.17	1.18	1.63	2.32	3.06	2.45	1.82		
Strontium (Sr)-Dissolved	0.102	0.096	0.1000	0.105	0.111	0.102	0.112	0.106	0.0996		
Thallium (Tl)-Dissolved	0.0000024	<0.0000020	0.0000031	0.0000021	0.0001060	0.0001520	0.0001270	0.0007780	0.0000959		
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Uranium (U)-Dissolved	0.000439	0.000418	0.000441	0.000451	0.000470	0.000529	0.000539	0.000541	0.000544		
Vanadium (V)-Dissolved	0.000137	0.000128	0.000147	0.000136	0.000090	0.000103	0.000107	0.000101	0.000134		
Zinc (Zn)-Dissolved	0.00095	0.00054	0.00112	0.00089	<0.0020	0.00340	0.00689	0.00578	0.00148		
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010		

Sample ID	NB-T1-9-APR-12	NB-T2-9-APR-12	NB-T3-9-APR-12	NB-T4-9-APR-12	NB-T5-9-APR-12	NB-T6-9-APR-12	NB-T1-15-APR12	NB-T2-15-APR12	NB-T3-15-APR12	NB-T4-15-APR12
Site	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**
TTS_Dist_CII	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**
Date Sampled	09-APR-12	09-APR-12	09-APR-12	09-APR-12	09-APR-12	09-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12
Time Sampled	13:30	13:30	13:30	13:30	13:30	13:30	12:30	12:30	12:30	12:30
ALS Sample ID	L1133205-13	L1133205-14	L1133205-15	L1133205-16	L1133205-17	L1133205-18	L1135488-13	L1135488-14	L1135488-15	L1135488-16
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests										
Conductivity	159	148	148	148	149	149	151	144	144	145
Hardness (as CaCO3)	73.6	73.9	74.6	74.2	76.3	74.3	72.6	71.4	72.6	72.4
pH	8.1	8.1	8.11	8.08	8.12	8.11	8.07	8.09	8.07	8.08
Total Suspended Solids	<3.0	<3.0	<3.0	3.3	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	93	84	84	85	85	83	88	84	104	93
Turbidity	0.43	0.37	0.34	0.3	0.31	0.35	0.37	0.44	0.6	0.7
Anions and Nutrients										
Alkalinity, Total (as CaCO3)	65.5	65.9	66.3	66.7	67	65.5	65.1	65.2	65.1	65.1
Ammonia, Total (as N)	**0.0283**	<0.0050	<0.0050	<0.0050	<0.0050	**0.0198**	**0.0212**	<0.0050	<0.0050	<0.0050
Bromide (Br)	0.014	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050
Chloride (Cl)	**1.12**	**1**	**1**	**1**	**1.01**	**1.06**	**1.09**	**0.96**	**0.96**	**0.96**
Fluoride (F)	0.109	0.071	0.071	0.071	0.071	0.072	0.091	0.072	0.071	0.072
Nitrate (as N)	0.165	0.151	0.152	0.154	0.154	0.155	0.161	0.151	0.148	0.149
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen										
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	0.002	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0035	0.0034	0.0037	0.0032	0.0031	0.0061	0.0039	0.0035	0.0042	0.0046
Sulfate (SO4)	17.1	12.6	12.5	12.6	12.6	13.3	15.2	12	12	12
Total Metals										
Mercury (Hg)-Total	<0.000010	-	-	-	-	-	<0.000010	-	-	-
Total Metals (Undigested)										
Aluminum (Al)-Total	0.00932	0.0097	0.0101	0.0092	0.00946	0.0133	0.012	0.00942	0.0117	0.0101
Antimony (Sb)-Total	0.000356	0.000061	0.000043	0.000048	0.000045	0.000318	0.000241	0.000045	0.000048	0.000041
Arsenic (As)-Total	0.000669	0.000283	0.000251	0.000256	0.00029	0.000477	0.000405	0.000256	0.000263	0.00025
Barium (Ba)-Total	0.0231	0.0229	0.0227	0.0229	0.023	0.0231	0.0222	0.0222	0.0226	0.022
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	0.0000163	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000391	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.000566**	**0.0000217**	0.0000161	0.0000167	0.0000151	**0.000203**	**0.000439**	0.0000098	0.0000117	0.0000082
Calcium (Ca)-Total	21.7	21.8	21.9	22	22.5	21.8	21.3	20.9	21	21
Chromium (Cr)-Total	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000139	0.0000072	0.0000051	0.0000051	<0.0000050	0.000015	0.0000184	0.0000109	0.0000098	0.0000097
Copper (Cu)-Total	0.00082	0.00034	0.00032	0.00033	0.00033	0.00067	0.00055	0.00029	0.00029	0.00027
Iron (Fe)-Total	0.0125	0.01	0.0095	0.0089	0.0099	0.0152	0.0125	0.0085	0.011	0.0108
Lead (Pb)-Total	**0.00353**	0.000478	0.000122	0.000297	0.000179	**0.00534**	0.000422	0.0000721	0.0000776	0.0000703
Lithium (Li)-Total	0.00133	0.00126	0.00139	0.00136	0.00135	0.0013	0.00129	0.00115	0.00125	0.0012
Magnesium (Mg)-Total	5.06	5.09	5.11	5.1	5.13	4.97	4.97	4.98	5.05	5.02
Manganese (Mn)-Total	0.00384	0.00204	0.00185	0.00205	0.00198	0.00309	0.00318	0.00157	0.00172	0.0018
Molybdenum (Mo)-Total	0.000619	0.000516	0.000523	0.000518	0.00053	0.000516	0.000562	0.000524	0.000522	0.00051
Nickel (Ni)-Total	0.000324	0.000239	0.000257	0.000292	0.000234	0.000296	0.000288	0.000279	0.000272	0.00027
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.73	0.633	0.648	0.629	0.619	0.659	0.644	0.635	0.648	0.618
Selenium (Se)-Total	**0.00057**	**0.000231**	**0.000251**	**0.000249**	**0.000261**	**0.000251**	**0.000341**	**0.000203**	**0.000219**	**0.000232**
Silicon (Si)-Total	2.08	2.12	2.11	2.1	2.15	2.33	2.15	2.13	2.17	2.14
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	3.06	1.89	1.91	1.94	1.93	1.98	2.45	1.64	1.65	1.62
Strontium (Sr)-Total	0.111	0.109	0.108	0.109	0.109	0.11	0.106	0.105	0.105	0.1
Thallium (Tl)-Total	0.000129	0.000002	0.0000022	0.0000024	<0.0000020	0.0000101	0.000779	<0.0000020	<0.0000020	<0.0000020
Tin (Sn)-Total	0.000018	<0.000010	<0.000010	<0.000010	<0.000010	0.000028	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000531	0.000511	0.000512	0.000513	0.000523	0.000524	0.000534	0.000531	0.000535	0.000483
Vanadium (V)-Total	0.000114	0.000121	0.000105	0.000114	0.00011	0.000131	0.000105	0.00012	0.000117	0.000126
Zinc (Zn)-Total	**0.00861**	0.00144	0.00117	0.00114	0.0012	0.00415	0.0064	0.00135	0.0012	0.00105
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals										
Dissolved Metals Filtration Location										
Aluminum (Al)-Dissolved	0.00359	0.00295	0.00391	0.00290	0.00306	0.00322	0.00416	0.00328	0.00309	0.00362
Antimony (Sb)-Dissolved	0.000341	0.000065	0.000048	0.000043	0.000046	0.000077	0.000233	0.000042	0.000046	0.000045
Arsenic (As)-Dissolved	0.000525	0.000254	0.000239	0.000251	0.000213	0.000305	0.000400	0.000273	0.000243	0.000284
Barium (Ba)-Dissolved	0.0227	0.0226	0.0224	0.0224	0.0223	0.0224	0.0219	0.0214	0.0219	0.0221
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0055	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0004970	0.0000156	0.0000112	0.0000120	0.0000068	0.0000223	0.0004160	0.0000098	0.0000073	0.0000068
Calcium (Ca)-Dissolved	21.3	21.4	21.4	21.5	22.2	21.3	21.0	20.5	20.8	20.8
Chromium (Cr)-Dissolved	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000162	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000062	0.0000126	<0.0000050	0.0000061	<0.0000050
Copper (Cu)-Dissolved	0.00060	0.00025	0.00026	0.00026	0.00026	0.00028	0.00041	0.00025	0.00024	0.00024
Iron (Fe)-Dissolved	0.0013	0.0011	0.0012	0.0011	0.0013	0.0012	0.0015	0.0014	0.0013	0.0014
Lead (Pb)-Dissolved	0.0013000	0.0000604	0.0000302	0.0000280	0.0000294	0.0001440	0.0001030	0.0000084	0.0000090	0.0000056
Lithium (Li)-Dissolved	0.00127	0.00126	0.00133	0.00133	0.00135	0.00132	0.00135	0.00126	0.00123	0.00120
Magnesium (Mg)-Dissolved	4.94	4.97	5.12	5.02	5.06	5.15	4.90	4.91	4.99	4.98
Manganese (Mn)-Dissolved	0.002770	0.000630	0.000630	0.000716	0.000656	0.001450	0.002060	0.000508	0.000498	0.000569
Mercury (Hg)-Dissolved	<0.000010	-	-	-	-	-	<0.000010	-	-	-
Molybdenum (Mo)-Dissolved	0.000636	0.000507	0.000529	0.000527	0.000511	0.000526	0.000588	0.000559	0.000553	0.000560
Nickel (Ni)-Dissolved	0.000295	0.000249	0.000246	0.000233	0.000221	0.000236	0.000271	0.000281	0.000247	0.000233
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.679	0.610	0.668	0.627	0.631	0.690	0.597	0.588	0.612	0.611
Selenium (Se)-Dissolved	0.000503	0.000240	0.000234	0.000231	0.000214	0.000218	0.000337	0.000220	0.000210	0.000232
Silicon (Si)-Dissolved	2.03	2.03	2.06	2.05	2.07	2.10	2.10	2.08	2.12	2.09
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	3.06	1.89	1.90	1.92	1.92	1.97	2.45	1.66	1.67	1.64
Strontium (Sr)-Dissolved	0.112	0.108	0.108	0.109	0.108	0.109	0.106	0.105	0.106	0.104
Thallium (Tl)-Dissolved	0.0001270	0.0000039	0.0000033	0.0000035	0.0000022	0.0000037	0.0007780	<0.0000020	<0.0000020	<0.0000020
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000539	0.000527	0.000526	0.000528	0.000529	0.000538	0.000541	0.000543	0.000548	0.000553
Vanadium (V)-Dissolved	0.000107	0.000082	0.000115	0.000093	0.000100	0.000099	0.000101	0.000101	0.000108	0.000095
Zinc (Zn)-Dissolved	0.00689	0.00099	0.00184	0.00095	0.00091	0.00112	0.00578	0.00088	0.00089	0.00086
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	NB-T5-15-APR12	NB-T6-15-APR12	NB-T1-26JULY-12	NB-T2-26JULY-12	NB-T3-26JULY-12	NB-T4-26JULY-12	NB-T5-26JULY-12	NB-T6-26JULY-12	OB-G-R-28MAR12
Site	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**ob**
Sample	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**
TTS_Dist_CII	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**230**	**1090**
Date Sampled	15-APR-12	15-APR-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	28-MAR-12
Time Sampled	12:30	12:30	00:00	00:00	00:00	00:00	00:00	00:00	12:46
ALS Sample ID	L1135488-17	L1135488-18	L1185400-13	L1185400-14	L1185400-15	L1185400-16	L1185400-17	L1185400-18	L1129175-4
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests									
Conductivity	145	146	119	116	116	117	116	117	138
Hardness (as CaCO3)	72.1	72.5	60.3	60.3	60	60.4	60.3	60.2	69.6
pH	8.08	8.1	8.01	8.02	8	8.02	8.02	8	7.67
Total Suspended Solids	<3.0	<3.0	3	3.7	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	89	85	72	68	71	73	67	73	83
Turbidity	0.56	0.55	1.04	1.06	1.1	1.09	1.02	0.96	0.39
Anions and Nutrients									
Alkalinity, Total (as CaCO3)	65.1	65.1	55.4	55.4	55.4	55.2	54.9	55.3	62.9
Ammonia, Total (as N)	0.0059	0.0097	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0075
Bromide (Br)	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010
Chloride (Cl)	**0.96**	**0.98**	**0.59**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.74**
Fluoride (F)	0.072	0.072	0.071	0.064	0.064	0.064	0.064	0.064	0.072
Nitrate (as N)	0.154	0.151	0.0904	0.0891	0.0894	0.0896	0.0893	0.0895	0.161
Nitrite (as N)	<0.0010	<0.0010	0.0018	0.0049	0.0054	0.0024	0.0035	0.0019	<0.0010
Total Kjeldahl Nitrogen									
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	0.0021	0.0021	0.0024	0.0023	0.0025	0.0023	<0.0020
Phosphorus (P)-Total	0.0049	0.0044	0.0056	0.0061	0.0063	0.0049	0.0041	0.004	0.0037
Sulfate (SO4)	12.1	12.3	10.3	9.22	9.23	9.22	9.22	9.23	12.9
Total Metals									
Mercury (Hg)-Total	-	-	**0.00241**	-	-	-	-	-	**0.00095**
Total Metals (Undigested)									
Aluminum (Al)-Total	0.00959	0.0111	**0.0356**	**0.0354**	**0.0312**	**0.031**	**0.0366**	**0.0378**	0.0122
Antimony (Sb)-Total	0.000045	0.000054	0.0002	0.000041	0.000042	0.000036	0.00004	0.000043	0.000217
Arsenic (As)-Total	0.00026	0.000269	0.000327	0.000202	0.000222	0.000219	0.00021	0.000217	0.000263
Barium (Ba)-Total	0.0218	0.0228	0.0192	0.0199	0.0191	0.0202	0.0197	0.0192	0.0192
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000114	0.000014	**0.0000668**	0.0000139	0.0000111	0.0000153	0.0000159	**0.0000232**	**0.0000593**
Calcium (Ca)-Total	21.1	21.2	17.8	17.9	18	17.9	17.8	18.1	20.7
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000136	0.0000139	0.0000307	0.000024	0.0000224	0.0000207	0.0000248	0.0000269	0.0000127
Copper (Cu)-Total	0.00027	0.00029	0.00041	0.00034	0.00032	0.00033	0.00036	0.00033	0.00035
Iron (Fe)-Total	0.0087	0.0115	0.0312	0.0322	0.0249	0.0238	0.0319	0.0332	0.0124
Lead (Pb)-Total	0.0000634	0.0000911	0.000584	0.000152	0.000147	0.000152	0.000176	0.000285	0.000164
Lithium (Li)-Total	0.00126	0.00125	0.00095	0.00093	0.00095	0.00091	0.00064	0.001	0.00131
Magnesium (Mg)-Total	5.05	5.02	4.14	4.16	4.2	4.11	4.11	4.14	4.8
Manganese (Mn)-Total	0.00179	0.00216	0.00282	0.00267	0.00246	0.00241	0.00265	0.0028	0.00204
Molybdenum (Mo)-Total	0.00052	0.000504	0.000492	0.000505	0.000483	0.000488	0.000469	0.000506	0.000493
Nickel (Ni)-Total	0.000256	0.00027	0.000319	0.000297	0.00031	0.000288	0.000324	0.000293	0.000367
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.621	0.615	0.618	0.582	0.583	0.589	0.588	0.597	0.636
Selenium (Se)-Total	**0.000238**	**0.000233**	**0.000363**	**0.00023**	**0.000239**	**0.000238**	**0.000232**	**0.000219**	**0.000288**
Silicon (Si)-Total	2.15	2.12	2.18	2.2	2.18	2.17	2.15	2.19	1.93
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.61	1.67	1.87	1.17	1.17	1.15	1.18	1.19	1.69
Strontium (Sr)-Total	0.103	0.102	0.101	0.109	0.104	0.102	0.0939	0.106	0.113
Thallium (Tl)-Total	<0.0000020	<0.0000020	0.0000688	0.0000037	0.0000064	0.0000028	0.0000026	0.0000029	0.0000728
Tin (Sn)-Total	<0.000010	0.000151	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	0.00138	0.00167	0.0011	0.00105	0.00149	0.00161	0.00079
Uranium (U)-Total	0.000519	0.000504	0.000443	0.000486	0.000453	0.000448	0.000455	0.000464	0.000454
Vanadium (V)-Total	0.000113	0.000111	0.000206	0.000191	0.000195	0.000177	0.000204	0.000215	0.0001
Zinc (Zn)-Total	0.0011	0.00106	0.00294	0.00233	0.00124	0.0013	0.00147	0.00125	0.00183
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
Dissolved Metals									
Dissolved Metals Filtration Location									
Aluminum (Al)-Dissolved	0.00339	0.00408	0.0168	0.0150	0.0143	0.0147	0.0147	0.0139	0.00367
Antimony (Sb)-Dissolved	0.000045	0.000040	0.000144	0.000042	0.000042	0.000040	0.000036	0.000038	0.000183
Arsenic (As)-Dissolved	0.000235	0.000257	0.000278	0.000180	0.000186	0.000208	0.000198	0.000201	0.000250
Barium (Ba)-Dissolved	0.0218	0.0216	0.0194	0.0198	0.0189	0.0195	0.0187	0.0194	0.0188
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000065	0.0000102	0.0000401	0.0000088	0.0000076	0.0000065	0.0000083	0.0000067	0.0000417
Calcium (Ca)-Dissolved	20.8	20.9	17.4	17.5	17.4	17.5	17.5	17.5	20.2
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	0.00012	<0.00010
Cobalt (Co)-Dissolved	<0.0000050	0.0000063	0.0000100	0.0000079	0.0000072	0.0000082	0.000006	0.0000059	<0.0000050
Copper (Cu)-Dissolved	0.00024	0.00024	0.00035	0.00030	0.00032	0.00026	0.00065	0.00028	0.00025
Iron (Fe)-Dissolved	0.0013	0.0016	0.0038	0.0016	0.0017	0.0016	0.0015	0.0015	<0.0010
Lead (Pb)-Dissolved	0.0000159	0.0000180	0.0001510	0.0000085	0.0000124	0.0000084	0.0000212	0.0000074	0.0000179
Lithium (Li)-Dissolved	0.00127	0.00131	0.00083	0.00089	0.00088	0.00086	0.00091	0.00092	0.00122
Magnesium (Mg)-Dissolved	4.90	4.94	4.07	4.04	4.02	4.05	4.02	4.04	4.68
Manganese (Mn)-Dissolved	0.000574	0.000848	0.000455	0.000137	0.00017	0.000128	0.000145	0.000160	0.000372
Mercury (Hg)-Dissolved	-	-	<0.00050	-	-	-	-	-	<0.000010
Molybdenum (Mo)-Dissolved	0.000564	0.000557	0.000508	0.000491	0.000502	0.000488	0.000497	0.000485	0.000488
Nickel (Ni)-Dissolved	0.000264	0.000259	0.000304	0.000269	0.000268	0.000267	0.000259	0.000270	0.000332
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.617	0.604	0.608	0.565	0.586	0.567	0.563	0.558	0.621
Selenium (Se)-Dissolved	0.000220	0.000228	0.000384	0.000209	0.000233	0.000229	0.000256	0.000224	0.000241
Silicon (Si)-Dissolved	2.04	2.05	2.12	2.10	2.10	2.10	2.08	2.11	1.85
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.64	1.66	1.74	1.16	1.19	1.18	1.18	1.18	1.64
Strontium (Sr)-Dissolved	0.106	0.105	0.105	0.105	0.103	0.103	0.1020	0.102	0.110
Thallium (Tl)-Dissolved	<0.0000020	<0.0000020	0.0000628	<0.0000020	0.0000024	0.0000021	0.0000025	0.0000022	0.0000662
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000541	0.000547	0.000453	0.000450	0.000444	0.000457	0.000445	0.000452	0.000453
Vanadium (V)-Dissolved	0.000092	0.000093	0.000154	0.000129	0.000146	0.000125	0.000142	0.000143	0.000085
Zinc (Zn)-Dissolved	0.00081	0.00081	0.00140	0.00088	0.00169	0.00108	0.00116	0.00097	<0.0015
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	OB-G-R-3APR-12	OB-T1-9-APR-12	OB-T1-15-APR12	OB-G-R-27 APR 12	OLD BRIDGE GRAB	OLD BRIDGE GRAB	OB-T1-9-APR-12	OB-T2-9-APR-12	OB-T3-9-APR-12
Site	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**r-1mab**
TTS_Dist_CII	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**
Date Sampled	03-APR-12	09-APR-12	15-APR-12	27-APR-12	28-MAR-13	09-APR-13	09-APR-12	09-APR-12	09-APR-12
Time Sampled	12:00	14:30	13:00	00:00	13:50	00:00	14:30	14:30	14:30
ALS Sample ID	L1131351-4	L1133205-19	L1135488-19	L1140473-4	L1284870-4	L1288829-4	L1133205-19	L1133205-20	L1133205-21
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests									
Conductivity	149	151	146	132	146	141	151	150	150
Hardness (as CaCO3)	74.7	74.1	72.3	65.4	69.8	66.9	74.1	74.3	74.1
pH	7.43	8.11	8.07	7	8.06	8	8.11	8.12	8.1
Total Suspended Solids	<3.0	<3.0	<3.0	6	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	80	85	87	73	84	86	85	85	82
Turbidity	0.38	0.38	0.58	2.06	0.42	1.02	0.38	0.36	0.31
Anions and Nutrients									
Alkalinity, Total (as CaCO3)	66.8	66.6	65.1	69.2	68.4	55	66.6	67	66.5
Ammonia, Total (as N)	**0.0153**	0.0135	0.0074	0.0056	**0.0208**	**0.0175**	0.0135	0.01	0.0072
Bromide (Br)	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050	<0.010	<0.050	<0.050
Chloride (Cl)	**1.09**	**1.06**	**1.01**	**0.94**	**0.91**	**0.97**	**1.06**	**1.04**	**1.03**
Fluoride (F)	0.081	0.078	0.075	0.078	0.076	0.087	0.078	0.075	0.073
Nitrate (as N)	0.161	0.158	0.154	0.148	0.146	0.147	0.158	0.155	0.156
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen					0.052	0.071			
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	0.0026	0.0023	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0041	0.0037	0.004	0.009	0.0032	0.0054	0.0037	0.0034	0.0036
Sulfate (SO4)	13.4	13.7	12.7	11.6	12.9	12.9	13.7	13.2	13
Total Metals									
Mercury (Hg)-Total	**0.0009**	<0.000010	<0.000010	**0.00552**	<0.0020	<0.0011	<0.000010	-	-
Total Metals (Undigested)									
Aluminum (Al)-Total	0.0114	0.00943	0.0116	**0.0772**	0.01	**0.0225**	0.00943	0.0104	0.0109
Antimony (Sb)-Total	0.000234	0.000167	0.00009	0.000116	0.000215	0.00015	0.000167	0.000115	0.000077
Arsenic (As)-Total	0.000585	0.000375	0.00032	0.000337	0.000318	0.000334	0.000375	0.000317	0.00031
Barium (Ba)-Total	0.0222	0.0229	0.0229	0.0227	0.0205	0.02	0.0229	0.023	0.0231
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	0.0051	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.000108**	**0.0000943**	**0.0000651**	**0.000045**	**0.0000706**	**0.000103**	**0.0000943**	**0.0000515**	**0.0000383**
Calcium (Ca)-Total	21.9	22.2	21.1	19.3	20.3	19.6	22.2	22.1	21.7
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	0.00017	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000141	0.0000088	0.0000136	0.0000603	0.0000114	0.0000247	0.0000088	0.0000078	<0.0000050
Copper (Cu)-Total	0.00041	0.0005	0.0004	0.00058	0.00039	0.00054	0.0005	0.00041	0.00035
Iron (Fe)-Total	0.0122	0.0118	0.0124	0.0922	0.0064	0.0219	0.0118	0.0096	0.0105
Lead (Pb)-Total	0.00017	0.00055	0.000144	0.000951	0.000116	0.000322	0.00055	0.000151	0.000138
Lithium (Li)-Total	0.00109	0.00134	0.00116	0.00127	0.00075	0.00108	0.00134	0.0013	0.00127
Magnesium (Mg)-Total	5.05	5.03	4.98	4.45	4.79	4.51	5.03	5.01	5.06
Manganese (Mn)-Total	0.00274	0.00243	0.0022	0.00675	0.00212	0.00312	0.00243	0.00198	0.00194
Molybdenum (Mo)-Total	0.000532	0.000538	0.000597	0.000481	0.000558	0.000575	0.000538	0.000548	0.000522
Nickel (Ni)-Total	0.000331	0.000247	0.000283	0.000382	0.000349	0.000322	0.000247	0.00026	0.000263
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.652	0.638	0.63	0.65	0.612	0.696	0.638	0.624	0.629
Selenium (Se)-Total	**0.000454**	**0.000439**	**0.000254**	**0.000273**	**0.000395**	**0.000301**	**0.000439**	**0.00033**	**0.000312**
Silicon (Si)-Total	2.19	2.12	2.17	2.47	2.02	2.46	2.12	2.11	2.1
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	2.02	2.25	1.83	1.68	1.85	2.05	2.25	2.06	2
Strontium (Sr)-Total	0.0993	0.11	0.116	0.1	0.111	0.112	0.11	0.11	0.108
Thallium (Tl)-Total	0.0000653	0.0000829	0.000123	0.0000382	0.000134	0.0000638	0.0000829	0.00004	0.0000238
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	0.00391	<0.00050	0.00094	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000505	0.000533	0.000573	0.000586	0.000493	0.000511	0.000533	0.000516	0.000522
Vanadium (V)-Total	0.000118	0.000113	0.00012	0.000333	0.00011	0.000115	0.000113	0.000117	0.000109
Zinc (Zn)-Total	0.0037	0.00342	0.00246	0.00316	0.0021	0.00409	0.00342	0.0025	0.00171
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals									
Dissolved Metals Filtration Location									
Aluminum (Al)-Dissolved	0.00376	0.00308	0.00347	0.0110			0.00308	0.00359	0.00304
Antimony (Sb)-Dissolved	0.000234	0.000168	0.000093	0.000120			0.000168	0.000113	0.000086
Arsenic (As)-Dissolved	0.000492	0.000316	0.000328	0.000319			0.000316	0.000309	0.000285
Barium (Ba)-Dissolved	0.0217	0.0227	0.0224	0.0206			0.0227	0.0224	0.0225
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010			<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050			<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	0.0110	<0.0050	<0.0050	<0.0050			<0.0050	0.0064	<0.0050
Cadmium (Cd)-Dissolved	0.0000999	0.0000702	0.0000559	0.0000330			0.0000702	0.0000437	0.0000319
Calcium (Ca)-Dissolved	21.7	21.5	20.9	19.0			21.5	21.5	21.4
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010			<0.00010	0.00011	0.00013
Cobalt (Co)-Dissolved	0.0000097	<0.0000050	0.0000074	0.0000095			<0.0000050	<0.0000050	<0.0000050
Copper (Cu)-Dissolved	0.00030	0.00039	0.00031	0.00033			0.00039	0.00033	0.00032
Iron (Fe)-Dissolved	0.002	0.0013	0.0016	0.0043			0.0013	0.0012	0.0013
Lead (Pb)-Dissolved	0.0000272	0.0000598	0.0000409	0.0000247			0.0000598	0.0000219	0.0000263
Lithium (Li)-Dissolved	0.00110	0.00142	0.00120	0.00107			0.00142	0.00126	0.00127
Magnesium (Mg)-Dissolved	5.01	4.96	4.90	4.34			4.96	5.00	5.03
Manganese (Mn)-Dissolved	0.00158	0.001100	0.000847	0.00093			0.001100	0.000886	0.000834
Mercury (Hg)-Dissolved	<0.00050	<0.000010	<0.000010	<0.00050			<0.000010	-	-
Molybdenum (Mo)-Dissolved	0.000587	0.000576	0.000673	0.000523			0.000576	0.000538	0.000575
Nickel (Ni)-Dissolved	0.000315	0.000244	0.000266	0.000225			0.000244	0.000262	0.000282
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050			<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.633	0.654	0.605	0.620			0.654	0.598	0.638
Selenium (Se)-Dissolved	0.000393	0.000375	0.000280	0.000256			0.000375	0.000324	0.000270
Silicon (Si)-Dissolved	2.15	2.04	2.12	2.32			2.04	2.06	2.06
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050			<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.98	2.22	1.80	1.73			2.22	2.04	1.97
Strontium (Sr)-Dissolved	0.104	0.111	0.117	0.1000			0.111	0.108	0.110
Thallium (Tl)-Dissolved	0.0000706	0.0000786	0.0001220	0.0000612			0.0000786	0.0000399	0.0000257
Tin (Sn)-Dissolved	0.000015	<0.000010	<0.000010	<0.000010			<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050			<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000534	0.000546	0.000585	0.000544			0.000546	0.000531	0.000534
Vanadium (V)-Dissolved	0.000096	0.000104	0.000108	0.000147			0.000104	0.000085	0.000117
Zinc (Zn)-Dissolved	0.00273	0.00233	0.00191	0.00145			0.00233	0.00188	0.00223
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010			<0.00010	<0.00010	<0.00010

Sample ID	OB-T4-9-APR-12	OB-T5-9-APR-12	OB-T6-9-APR-12	OB-T1-15-APR12	OB-T2-15-APR12	OB-T3-15-APR12	OB-T4-15-APR12	OB-T5-15-APR12	OB-T6-15-APR12
Site	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**
Sample	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**
TTS_Dist_CII	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**
Date Sampled	09-APR-12	09-APR-12	09-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12
Time Sampled	14:30	14:30	14:30	13:00	13:00	13:00	13:00	13:00	13:00
ALS Sample ID	L1133205-22	L1133205-23	L1133205-24	L1135488-19	L1135488-20	L1135488-21	L1135488-22	L1135488-23	L1135488-24
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests									
Conductivity	149	149	150	146	145	146	145	145	145
Hardness (as CaCO3)	74.1	75.1	75.1	72.3	72.2	72.5	72.3	72.4	72.7
pH	8.1	8.14	8.1	8.07	8.07	8.08	8.07	8.07	8.1
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	84	83	85	87	87	86	91	88	86
Turbidity	0.34	0.33	0.35	0.58	0.43	0.57	0.53	0.67	0.47
Anions and Nutrients									
Alkalinity, Total (as CaCO3)	67.4	67.4	66.6	65.1	65	65.3	65.8	65.3	65.2
Ammonia, Total (as N)	<0.0050	<0.0050	0.0129	0.0074	<0.0050	<0.0050	<0.0050	<0.0050	0.0062
Bromide (Br)	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	**1.01**	**1.01**	**1.15**	**1.01**	**0.97**	**0.98**	**0.96**	**0.96**	**0.97**
Fluoride (F)	0.08	0.071	0.071	0.075	0.072	0.073	0.072	0.072	0.072
Nitrate (as N)	0.155	0.152	0.162	0.154	0.15	0.153	0.152	0.15	0.149
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen									
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	0.0024	<0.0020	0.0023	<0.0020
Phosphorus (P)-Total	0.0035	0.0033	0.0033	0.004	0.0045	0.0046	0.0044	0.0042	0.0057
Sulfate (SO4)	12.6	12.6	13.2	12.7	12.2	12.3	12.1	12	12.2
Total Metals									
Mercury (Hg)-Total	-	-	-	<0.000010	-	-	-	-	-
Total Metals (Undigested)									
Aluminum (Al)-Total	0.00973	0.00821	0.0107	0.0116	0.00952	0.00902	0.00958	0.0125	0.00838
Antimony (Sb)-Total	0.000039	0.000042	0.00015	0.00009	0.000053	0.000067	0.000051	0.000044	0.000055
Arsenic (As)-Total	0.000262	0.000243	0.00039	0.00032	0.000303	0.000298	0.000259	0.000245	0.000256
Barium (Ba)-Total	0.0231	0.0232	0.0235	0.0229	0.0224	0.0223	0.0226	0.0224	0.0221
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	0.0000151	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000115	0.0000125	**0.000124**	**0.0000651**	0.0000192	**0.0000303**	0.0000127	0.0000122	0.0000117
Calcium (Ca)-Total	21.9	21.5	22.1	21.1	21.2	21.2	21.1	21	21.1
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	<0.0000050	0.0000079	0.0000116	0.0000136	0.0000082	0.0000117	0.0000126	0.0000056	0.0000084
Copper (Cu)-Total	0.00031	0.00032	0.00045	0.0004	0.0003	0.00033	0.00029	0.00028	0.00028
Iron (Fe)-Total	0.0096	0.0093	0.0141	0.0124	0.0088	0.0081	0.0122	0.0132	0.0082
Lead (Pb)-Total	0.0000822	0.0000793	**0.00304**	0.000144	0.0000806	0.0000933	0.0000706	0.0000698	0.0000936
Lithium (Li)-Total	0.00129	0.00121	0.00126	0.00116	0.00114	0.00115	0.00119	0.00142	0.00118
Magnesium (Mg)-Total	5.06	5.05	5.07	4.98	5.03	5.03	5.03	5	5.02
Manganese (Mn)-Total	0.00188	0.00186	0.00268	0.0022	0.00174	0.0017	0.00173	0.00184	0.00186
Molybdenum (Mo)-Total	0.000524	0.000546	0.000532	0.000597	0.000595	0.000584	0.000577	0.000516	0.000578
Nickel (Ni)-Total	0.000264	0.000297	0.000287	0.000283	0.000286	0.000281	0.000265	0.000237	0.000283
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.615	0.607	0.651	0.63	0.609	0.638	0.63	0.589	0.609
Selenium (Se)-Total	**0.000251**	**0.00024**	**0.000229**	**0.000254**	**0.000251**	**0.000273**	**0.000245**	**0.000246**	**0.000244**
Silicon (Si)-Total	2.11	2.09	2.12	2.17	2.14	2.16	2.13	2.13	2.13
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.93	1.91	2.03	1.83	1.69	1.71	1.65	1.71	1.65
Strontium (Sr)-Total	0.109	0.107	0.111	0.116	0.117	0.116	0.116	0.106	0.112
Thallium (Tl)-Total	0.0000022	0.0000021	0.0000055	0.000123	0.0000213	0.0000546	<0.0000020	<0.0000020	<0.0000020
Tin (Sn)-Total	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	0.00055	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	<0.00050
Uranium (U)-Total	0.000522	0.000523	0.000533	0.000573	0.000563	0.000563	0.00057	0.000531	0.000553
Vanadium (V)-Total	0.000119	0.000116	0.000132	0.00012	0.000109	0.000126	0.000118	0.000122	0.000122
Zinc (Zn)-Total	0.00166	0.001	0.00417	0.00246	0.00124	0.00176	0.00102	0.00095	0.00107
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals									
Dissolved Metals Filtration Location									
Aluminum (Al)-Dissolved	0.00283	0.00295	0.00337	0.00347	0.00304	0.00329	0.00368	0.00296	0.00367
Antimony (Sb)-Dissolved	0.000044	0.000049	0.000099	0.000093	0.000053	0.000065	0.000053	0.000046	0.000053
Arsenic (As)-Dissolved	0.000247	0.000238	0.000298	0.000328	0.000260	0.000268	0.000247	0.000260	0.000252
Barium (Ba)-Dissolved	0.0225	0.0228	0.0224	0.0224	0.0222	0.0222	0.0220	0.0219	0.0226
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000081	0.0000076	0.0000549	0.0000559	0.0000164	0.0000305	0.0000077	0.0000088	0.0000086
Calcium (Ca)-Dissolved	21.3	21.7	21.8	20.9	20.8	20.9	20.8	20.9	20.9
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	<0.0000050	<0.0000050	<0.0000050	0.0000074	0.0000055	0.0000066	0.0000067	<0.0000050	0.0000054
Copper (Cu)-Dissolved	0.00026	0.00025	0.00030	0.00031	0.00026	0.00026	0.00023	0.00021	0.00024
Iron (Fe)-Dissolved	0.0011	0.0011	0.0012	0.0016	0.0014	0.0015	0.0014	<0.0010	0.0015
Lead (Pb)-Dissolved	0.0000163	0.0000115	0.0004880	0.0000409	0.0000096	0.0000126	0.0000082	0.0000078	0.0000068
Lithium (Li)-Dissolved	0.00133	0.00117	0.00122	0.00120	0.00120	0.00118	0.00121	0.00125	0.00128
Magnesium (Mg)-Dissolved	5.06	5.06	5.03	4.90	4.93	4.93	4.93	4.93	4.95
Manganese (Mn)-Dissolved	0.000600	0.000541	0.001520	0.000847	0.000550	0.000702	0.000573	0.000341	0.000704
Mercury (Hg)-Dissolved	-	-	-	<0.000010	-	-	-	-	-
Molybdenum (Mo)-Dissolved	0.000552	0.000548	0.000546	0.000673	0.000604	0.000615	0.000597	0.000549	0.000610
Nickel (Ni)-Dissolved	0.000238	0.000248	0.000257	0.000266	0.000245	0.000249	0.000267	0.000253	0.000258
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.643	0.634	0.653	0.605	0.590	0.611	0.615	0.589	0.613
Selenium (Se)-Dissolved	0.000227	0.000221	0.000236	0.000280	0.000247	0.000243	0.000241	0.000193	0.000242
Silicon (Si)-Dissolved	2.05	2.07	2.07	2.12	2.08	2.10	2.08	2.09	2.09
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.90	1.93	1.98	1.80	1.69	1.73	1.64	1.67	1.68
Strontium (Sr)-Dissolved	0.110	0.109	0.111	0.117	0.117	0.117	0.115	0.105	0.116
Thallium (Tl)-Dissolved	0.0000032	0.0000029	0.0000055	0.0001220	0.0000214	0.0000575	<0.0000020	0.0000068	<0.0000020
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000542	0.000532	0.000549	0.000585	0.000594	0.000590	0.000588	0.000554	0.000583
Vanadium (V)-Dissolved	0.000092	0.000093	0.000098	0.000108	0.000107	0.000114	0.000105	0.000104	0.000118
Zinc (Zn)-Dissolved	0.00089	0.00084	0.00288	0.00191	0.00098	0.00116	0.00076	0.00079	0.00073
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	OB-T1-26JUL-12	OB-T2-26JUL-12	OB-T3-26JUL-12	OB-T4-26JUL-12	OB-T5-26JUL-12	OB-T6-26JUL-12	WS-G-L-28MAR12	WS-G-L-3APR-12	WS-T1-9-APR-12	WS-T1-15APR12	WS-G-L-27 APR 12
Site	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**	**wa**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**	**15800**
Date Sampled	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	28-MAR-12	03-APR-12	09-APR-12	15-APR-12	27-APR-12
Time Sampled	00:00	00:00	00:00	00:00	00:00	00:00	13:04	12:30	00:00	14:00	00:00
ALS Sample ID	L1185400-19	L1185400-20	L1185400-21	L1185400-22	L1185400-23	L1185400-24	L1129175-5	L1131351-5	L1133205-25	L1135488-25	L1140473-5
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests											
Conductivity	118	118	117	117	117	117	136	146	151	144	131
Hardness (as CaCO3)	60.3	59.4	59.7	58.5	59.4	60.1	69.1	73.3	74.1	72	64.8
pH	8.02	8.03	8.01	8.03	8.04	8.03	7.69	7.44	8.12	8.09	7
Total Suspended Solids	3	<3.0	<3.0	3.7	<3.0	3	<3.0	<3.0	<3.0	<3.0	8.7
Total Dissolved Solids	71	68	67	66	68	67	79	76	85	86	76
Turbidity	1.1	0.96	1	0.95	1	1.11	0.38	0.43	0.31	0.57	3.21
Anions and Nutrients											
Alkalinity, Total (as CaCO3)	55.4	55	54.9	55.3	55.3	55.2	62.8	66.4	67	65	68.8
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0075	0.0055	<0.0050	0.0063
Bromide (Br)	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010	<0.010	<0.010
Chloride (Cl)	**0.58**	**0.57**	**0.57**	**0.57**	**0.57**	**0.57**	**0.71**	**1.02**	**1.05**	**1.01**	**0.92**
Fluoride (F)	0.066	0.064	0.064	0.064	0.064	0.064	0.064	0.073	0.071	0.073	0.074
Nitrate (as N)	0.0904	0.0896	0.0891	0.0892	0.0894	0.0895	0.159	0.157	0.153	0.151	0.145
Nitrite (as N)	0.002	0.004	0.002	0.0018	0.002	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen											
Phosphorus (P)-Total Dissolved	0.0025	0.0025	0.0022	0.0024	<0.0020	0.0026	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0043	0.0075	0.005	0.0047	0.0053	0.0052	0.0039	0.0039	0.0045	0.005	0.0164
Sulfate (SO4)	9.57	9.25	9.23	9.22	9.24	9.22	11.9	12.4	12.8	12.2	10.9
Total Metals											
Mercury (Hg)-Total	**0.00138**	-	-	-	-	-	**0.00057**	**0.00057**	<0.000010	<0.000010	**0.00156**
Total Metals (Undigested)											
Aluminum (Al)-Total	**0.0412**	**0.0364**	**0.0328**	**0.0336**	**0.0353**	**0.0286**	0.0131	0.011	0.00862	0.0126	**0.0889**
Antimony (Sb)-Total	0.000118	0.000063	0.000055	0.000035	0.000045	0.00004	0.000075	0.000106	0.000084	0.000076	0.000112
Arsenic (As)-Total	0.000284	0.00024	0.00023	0.000217	0.000218	0.000196	0.000195	0.00036	0.000297	0.000299	0.000336
Barium (Ba)-Total	0.02	0.0197	0.0198	0.0199	0.0197	0.0192	0.0193	0.0227	0.023	0.023	0.0228
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.0000344**	**0.0000214**	**0.0000172**	**0.0000135**	**0.000017**	0.0000175	**0.0000213**	**0.0000391**	**0.0000352**	**0.0000271**	**0.0000379**
Calcium (Ca)-Total	17.6	17.7	17.6	17.7	17.8	17.9	20.5	21.6	22.5	21.4	19.2
Chromium (Cr)-Total	0.0001	0.0001	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00019
Cobalt (Co)-Total	0.0000248	0.0000273	0.0000237	0.0000308	0.0000218	0.0000226	0.0000113	0.000013	0.000005	0.0000136	0.0000796
Copper (Cu)-Total	0.00042	0.00042	0.00037	0.00035	0.00041	0.00034	0.00035	0.00033	0.00037	0.00037	0.00057
Iron (Fe)-Total	0.0373	0.0333	0.0283	0.0315	0.0243	0.0241	0.0122	0.0114	0.0106	0.0145	0.109
Lead (Pb)-Total	0.000733	0.000333	0.000221	0.000152	0.000187	0.000159	0.0000918	0.0000941	0.00016	0.000157	0.000507
Lithium (Li)-Total	0.00093	0.00093	0.00096	0.00094	0.00098	0.00083	0.00112	0.00103	0.0014	0.00122	0.00124
Magnesium (Mg)-Total	4.06	4.11	4.08	4.09	4.11	4.14	4.82	5.02	5.11	5.04	4.44
Manganese (Mn)-Total	0.00301	0.00276	0.00267	0.0028	0.00255	0.00243	0.00173	0.00231	0.00205	0.00206	0.00809
Molybdenum (Mo)-Total	0.000474	0.000478	0.000502	0.000461	0.000469	0.000494	0.000474	0.000523	0.000526	0.000572	0.000483
Nickel (Ni)-Total	0.000316	0.000305	0.000305	0.000289	0.000283	0.000255	0.000343	0.000302	0.000277	0.000271	0.000386
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.594	0.561	0.586	0.579	0.578	0.644	0.633	0.597	0.641	0.653	0.66
Selenium (Se)-Total	**0.000269**	**0.000239**	**0.000237**	**0.000262**	**0.000241**	**0.000232**	0.000198	**0.000277**	**0.000269**	**0.00024**	**0.000266**
Silicon (Si)-Total	2.17	2.19	2.19	2.18	2.22	2.21	1.9	2.15	2.16	2.17	2.5
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.38	1.27	1.25	1.22	1.2	1.12	1.43	1.77	2.02	1.75	1.62
Strontium (Sr)-Total	0.1	0.0998	0.102	0.102	0.104	0.1	0.111	0.0992	0.11	0.116	0.1
Thallium (Tl)-Total	0.0000152	0.0000086	0.0000069	0.0000023	0.0000031	0.0000023	0.0000171	0.0000173	0.0000123	0.0000294	0.0000236
Tin (Sn)-Total	0.000019	<0.000010	0.000045	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000023
Titanium (Ti)-Total	0.00173	0.00165	0.00099	0.0011	0.00099	0.00101	0.0005	<0.00050	<0.00050	<0.00050	0.00391
Uranium (U)-Total	0.000454	0.000453	0.000457	0.000455	0.000452	0.000426	0.000448	0.000503	0.000531	0.000564	0.000567
Vanadium (V)-Total	0.000199	0.000192	0.000168	0.000193	0.000194	0.000176	0.000097	0.000119	0.000116	0.00012	0.000392
Zinc (Zn)-Total	0.00227	0.00134	0.00154	0.00113	0.00242	0.00118	0.00132	0.00201	0.0016	0.00139	0.00287
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals											
Dissolved Metals Filtration Location											
Aluminum (Al)-Dissolved	0.0147	0.0144	0.0223	0.0150	0.0149	0.0146	0.00348	0.00410	0.00370	0.00373	0.0119
Antimony (Sb)-Dissolved	0.000081	0.000053	0.000053	0.000034	0.000042	0.000043	0.000071	0.000114	0.000086	0.000072	0.000093
Arsenic (As)-Dissolved	0.000244	0.000210	0.000204	0.000195	0.000212	0.000203	0.000192	0.000331	0.000281	0.000285	0.000261
Barium (Ba)-Dissolved	0.0198	0.0194	0.0196	0.0195	0.0192	0.0194	0.0187	0.0220	0.0226	0.0223	0.0206
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0105	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000218	0.0000116	0.0000111	0.0000072	0.0000069	0.0000087	0.0000173	0.0000333	0.0000244	0.0000228	0.0000180
Calcium (Ca)-Dissolved	17.5	17.2	17.3	17.0	17.2	17.5	20.0	21.2	21.6	20.8	18.8
Chromium (Cr)-Dissolved	<0.00010	0.00011	<0.00010	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000060	0.0000063	0.0000064	<0.0000050	0.0000109	0.0000059	<0.0000050	0.0000093	<0.0000050	0.0000066	0.0000133
Copper (Cu)-Dissolved	0.00031	0.00033	0.00034	0.00029	0.00032	0.00026	0.00024	0.00025	0.00029	0.00029	0.00036
Iron (Fe)-Dissolved	0.0015	0.0018	0.0037	0.0018	0.0018	0.0019	<0.0010	<0.0010	0.0012	0.0019	0.0059
Lead (Pb)-Dissolved	0.0000163	0.0000175	0.0000251	0.0000079	0.0000090	<0.0000050	0.0000102	0.0000237	0.0000283	0.0000212	0.0000219
Lithium (Li)-Dissolved	0.00090	0.00089	0.00093	0.00078	0.00094	0.00094	0.00106	0.00111	0.00129	0.00122	0.00101
Magnesium (Mg)-Dissolved	4.04	3.98	4.01	3.94	3.98	4.01	4.69	4.94	4.90	4.87	4.33
Manganese (Mn)-Dissolved	0.000175	0.000146	0.000241	0.000175	0.000109	0.000057	0.000266	0.00108	0.000653	0.000624	0.00106
Mercury (Hg)-Dissolved	<0.00050	-	-	-	-	-	<0.000010	<0.00050	<0.000010	<0.000010	<0.00050
Molybdenum (Mo)-Dissolved	0.000507	0.000488	0.000549	0.000470	0.000492	0.000518	0.000487	0.000580	0.000537	0.000592	0.000530
Nickel (Ni)-Dissolved	0.000287	0.000252	0.000283	0.000281	0.000283	0.000220	0.000330	0.000295	0.000240	0.000228	0.000237
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.571	0.557	0.561	0.574	0.566	0.589	0.613	0.607	0.603	0.628	0.620
Selenium (Se)-Dissolved	0.000261	0.000212	0.000222	0.000220	0.000220	0.000219	0.000175	0.000279	0.000255	0.000258	0.000239
Silicon (Si)-Dissolved	2.10	2.09	2.13	2.08	2.08	2.11	1.84	2.11	2.02	2.10	2.33
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.30	1.19	1.22	1.20	1.21	1.15	1.38	1.71	2.00	1.75	1.61
Strontium (Sr)-Dissolved	0.104	0.103	0.102	0.093	0.1050	0.105	0.112	0.107	0.110	0.114	0.0991
Thallium (Tl)-Dissolved	0.0000136	0.0000048	0.0000052	0.0000022	0.0000027	<0.0000020	0.0000159	0.0000191	0.0000140	0.0000293	0.0000247
Tin (Sn)-Dissolved	<0.000010	<0.000010	0.000021	0.000038	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000482	0.000452	0.000454	0.000432	0.000453	0.000437	0.000460	0.000545	0.000537	0.000566	0.000526
Vanadium (V)-Dissolved	0.000144	0.000134	0.000138	0.000135	0.000146	0.000151	0.000079	0.000093	0.000105	0.000104	0.000150
Zinc (Zn)-Dissolved	0.00122	0.00088	0.00150	0.00076	0.00125	0.00077	<0.0015	0.00198	0.00160	0.00105	0.00101
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	WANETA GRAB	WANETA GRAB	WS-T1-9-APR-12	WS-T2-9-APR-12	WS-T3-9-APR-12	WS-T4-9-APR-12	WS-T5-9-APR-12
Site	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**
TTS_Dist_CII	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**
Date Sampled	28-MAR-13	09-APR-13	09-APR-12	09-APR-12	09-APR-12	09-APR-12	09-APR-12
Time Sampled	13:05	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L1284870-5	L1288829-5	L1133205-25	L1133205-26	L1133205-27	L1133205-28	L1133205-29
Matrix	Water	Water	Water	Water	Water	Water	Water
Physical Tests							
Conductivity	142	139	151	151	151	151	152
Hardness (as CaCO3)	70.4	67.2	74.1	73.5	71.1	74.5	74.8
pH	7.88	8.02	8.12	8.11	8.11	8.12	8.13
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	84	85	85	88	84	83	85
Turbidity	0.63	0.95	0.31	0.4	0.3	0.35	0.36
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	65.9	54.4	67	66.7	66.4	66.7	67
Ammonia, Total (as N)	0.0112	0.0092	0.0055	0.0056	0.0059	0.007	0.0061
Bromide (Br)	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	**0.82**	**0.89**	**1.05**	**1.05**	**1.04**	**1.05**	**1.05**
Fluoride (F)	0.069	0.077	0.071	0.073	0.072	0.072	0.072
Nitrate (as N)	0.144	0.143	0.153	0.145	0.145	0.144	0.144
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.05	0.072					
Phosphorus (P)-Total Dissolved	0.0029	<0.0020	<0.0020	<0.0020	0.0021	0.0023	<0.0020
Phosphorus (P)-Total	0.0032	0.0051	0.0045	0.0045	0.0039	0.0036	0.0036
Sulfate (SO4)	12.2	11.5	12.8	12.7	12.8	12.7	12.8
Total Metals							
Mercury (Hg)-Total	<0.0010	<0.00078	<0.000010	-	-	-	-
Total Metals (Undigested)							
Aluminum (Al)-Total	0.0108	**0.0224**	0.00862	0.0118	0.00944	0.00962	0.0089
Antimony (Sb)-Total	0.000117	0.000093	0.000084	0.000077	0.000086	0.000073	0.000069
Arsenic (As)-Total	0.000242	0.000266	0.000297	0.000315	0.000275	0.000287	0.000286
Barium (Ba)-Total	0.02	0.0203	0.023	0.023	0.0228	0.023	0.0228
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.0000481**	**0.0000353**	**0.0000352**	**0.000034**	**0.0000365**	**0.0000304**	**0.0000333**
Calcium (Ca)-Total	19.9	19.5	22.5	22.6	21.8	21.8	21.8
Chromium (Cr)-Total	**0.00096**	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.000117	0.0000171	0.000005	<0.0000050	0.0000054	0.0000079	0.000006
Copper (Cu)-Total	0.00054	0.00047	0.00037	0.00037	0.00036	0.00036	0.00039
Iron (Fe)-Total	0.0173	0.0228	0.0106	0.0118	0.0096	0.0098	0.0103
Lead (Pb)-Total	0.000134	0.000187	0.00016	0.000221	0.00035	0.000167	0.000218
Lithium (Li)-Total	0.00099	0.00087	0.0014	0.00128	0.00122	0.00132	0.00128
Magnesium (Mg)-Total	4.74	4.5	5.11	5.17	4.88	5.04	5.16
Manganese (Mn)-Total	0.00187	0.00273	0.00205	0.00236	0.00208	0.00187	0.00199
Molybdenum (Mo)-Total	0.00139	0.000521	0.000526	0.000508	0.00053	0.00053	0.000531
Nickel (Ni)-Total	0.000345	0.000315	0.000277	0.000284	0.000275	0.00025	0.000248
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.567	0.674	0.641	0.661	0.596	0.617	0.659
Selenium (Se)-Total	**0.000225**	**0.000226**	**0.000269**	**0.000262**	**0.000268**	**0.000266**	**0.000263**
Silicon (Si)-Total	1.99	2.44	2.16	2.15	2.07	2.11	2.15
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.57	1.72	2.02	2.05	2.01	2	2
Strontium (Sr)-Total	0.111	0.108	0.11	0.109	0.106	0.11	0.11
Thallium (Tl)-Total	0.0000395	0.0000169	0.0000123	0.0000083	0.0000092	0.0000091	0.0000094
Tin (Sn)-Total	<0.000010	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	0.0011	<0.00050	<0.00050	0.0008	<0.00050	<0.00050
Uranium (U)-Total	0.000473	0.000511	0.000531	0.000529	0.000514	0.000523	0.000524
Vanadium (V)-Total	0.000273	0.000099	0.000116	0.000108	0.000116	0.000108	0.000113
Zinc (Zn)-Total	0.0017	0.00297	0.0016	0.002	0.00179	0.00157	0.00178
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals							
Dissolved Metals Filtration Location							
Aluminum (Al)-Dissolved			0.00370	0.00283	0.00277	0.00304	0.00346
Antimony (Sb)-Dissolved			0.000086	0.000079	0.000072	0.000071	0.000070
Arsenic (As)-Dissolved			0.000281	0.000257	0.000258	0.000272	0.000251
Barium (Ba)-Dissolved			0.0226	0.0224	0.0217	0.0224	0.0222
Beryllium (Be)-Dissolved			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved			<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved			0.0000244	0.0000235	0.0000240	0.0000238	0.0000288
Calcium (Ca)-Dissolved			21.6	21.3	20.5	21.5	21.7
Chromium (Cr)-Dissolved			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Copper (Cu)-Dissolved			0.00029	0.00029	0.00030	0.00030	0.00031
Iron (Fe)-Dissolved			0.0012	0.0011	0.0015	0.0012	0.0012
Lead (Pb)-Dissolved			0.0000283	0.0000243	0.0000167	0.0000286	0.0000344
Lithium (Li)-Dissolved			0.00129	0.00131	0.00120	0.00124	0.00128
Magnesium (Mg)-Dissolved			4.90	4.90	4.82	5.05	4.98
Manganese (Mn)-Dissolved			0.000653	0.000714	0.000726	0.000738	0.000740
Mercury (Hg)-Dissolved			<0.000010	-	-	-	-
Molybdenum (Mo)-Dissolved			0.000537	0.000559	0.000522	0.000548	0.000546
Nickel (Ni)-Dissolved			0.000240	0.000232	0.000237	0.000225	0.000226
Phosphorus (P)-Dissolved			<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved			0.603	0.613	0.610	0.635	0.608
Selenium (Se)-Dissolved			0.000255	0.000258	0.000238	0.000251	0.000234
Silicon (Si)-Dissolved			2.02	2.02	1.98	2.08	2.06
Silver (Ag)-Dissolved			<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved			2.00	1.99	1.96	1.98	1.98
Strontium (Sr)-Dissolved			0.110	0.111	0.103	0.111	0.110
Thallium (Tl)-Dissolved			0.0000140	0.0000109	0.0000104	0.0000093	0.0000075
Tin (Sn)-Dissolved			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved			<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved			0.000537	0.000535	0.000500	0.000545	0.000537
Vanadium (V)-Dissolved			0.000105	0.000089	0.000115	0.000111	0.000098
Zinc (Zn)-Dissolved			0.00160	0.00133	0.00118	0.00135	0.00159
Zirconium (Zr)-Dissolved			<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	WS-T6-9-APR-12	WS-T1-15APR12	WS-T2-15APR12	WS-T3-15APR12	WS-T4-15APR12	WS-T5-15APR12	WS-T6-15APR12	WS-T1	WS-T2	WS-T3	WS-T4	WS-T5	WS-T6
Site	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**
Sample	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1md**	**l-1mab**	**l-sh**
TTS_Dist_CII	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**
Date Sampled	09-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	15-APR-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12	26-JUL-12
Time Sampled	00:00	14:00	14:00	14:00	14:00	14:00	14:00	00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID	L1133205-30	L1135488-25	L1135488-26	L1135488-27	L1135488-28	L1135488-29	L1135488-30	L1185400-25	L1185400-26	L1185400-27	L1185400-28	L1185400-29	L1185400-30
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests													
Conductivity	145	144	145	145	146	146	145	117	117	117	117	117	117
Hardness (as CaCO3)	74	72	71.7	71.8	71.4	71.9	71.7	58.9	59.7	59.6	60.3	60	60
pH	8.13	8.09	8.1	8.1	8.09	8.09	8.09	7.96	8	8	8.02	8.01	8.01
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	4.3	3.7	5	4.3	3	<3.0
Total Dissolved Solids	83	86	86	88	86	84	87	69	69	64	68	63	65
Turbidity	0.34	0.57	0.72	0.51	0.64	0.71	0.56	1.22	1.1	1.05	1.16	1.25	1.03
Anions and Nutrients													
Alkalinity, Total (as CaCO3)	65.5	65	65	65.1	65.1	65.2	64.8	54.1	55.2	55.4	55.1	55.3	55.4
Ammonia, Total (as N)	0.0052	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Bromide (Br)	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	**1.06**	**1.01**	**0.99**	**0.99**	**1**	**0.99**	**1**	**0.58**	**0.58**	**0.58**	**0.58**	**0.58**	**0.59**
Fluoride (F)	0.072	0.073	0.072	0.072	0.072	0.073	0.072	0.065	0.065	0.065	0.065	0.065	0.065
Nitrate (as N)	0.142	0.151	0.152	0.149	0.149	0.15	0.152	0.0897	0.0902	0.0913	0.0904	0.09	0.0901
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0019	0.0025	0.0018	0.002	0.0018	0.0018
Total Kjeldahl Nitrogen													
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	0.0021	<0.0020	<0.0020	<0.0020	0.0022	0.0021	0.0021	0.0036	0.0026	0.0022
Phosphorus (P)-Total	0.0041	0.005	0.0049	0.0049	0.005	0.005	0.0048	0.0112	0.0054	0.0054	0.0055	0.005	0.0054
Sulfate (SO4)	12.7	12.2	12.2	12.2	12.2	12.2	12.2	9.33	9.32	9.35	9.36	9.33	9.32
Total Metals													
Mercury (Hg)-Total	-	<0.000010	-	-	-	-	-	**0.00094**	-	-	-	-	-
Total Metals (Undigested)													
Aluminum (Al)-Total	0.01	0.0126	0.0122	0.0111	0.012	0.0122	0.0133	**0.0529**	**0.0294**	**0.0325**	**0.034**	**0.0282**	**0.0487**
Antimony (Sb)-Total	0.000075	0.000076	0.000076	0.000072	0.000073	0.000062	0.000067	0.000129	0.000084	0.000082	0.000086	0.000076	0.000083
Arsenic (As)-Total	0.000285	0.000299	0.000297	0.000285	0.000283	0.000278	0.000282	0.000276	0.000231	0.000235	0.000248	0.000216	0.000243
Barium (Ba)-Total	0.023	0.023	0.0228	0.023	0.023	0.0228	0.0227	0.0208	0.0194	0.0191	0.0202	0.0179	0.0206
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000123	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	**0.0000313**	**0.0000271**	**0.0000268**	**0.0000237**	**0.0000271**	**0.0000238**	**0.0000259**	**0.0000195**	**0.0000187**	**0.0000187**	**0.0000207**	0.000018	0.0000204
Calcium (Ca)-Total	21.9	21.4	21.1	21.2	21.1	21	21	17.5	17.8	17.6	17.8	17.8	18
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	0.00013
Cobalt (Co)-Total	0.0000084	0.0000136	0.0000121	0.0000119	0.0000103	0.0000123	0.0000117	0.0000536	0.000027	0.0000262	0.0000272	0.0000219	0.0000392
Copper (Cu)-Total	0.00037	0.00037	0.00035	0.00037	0.00035	0.00036	0.00034	0.00149	0.00068	0.00061	0.00065	0.00052	0.00102
Iron (Fe)-Total	0.0106	0.0145	0.0131	0.0119	0.0118	0.0124	0.0126	0.182	0.027	0.028	0.0357	0.0223	0.0608
Lead (Pb)-Total	0.000149	0.000157	0.000152	0.00016	0.000127	0.000104	0.000149	0.000681	0.000446	0.000492	0.000444	0.000305	0.000436
Lithium (Li)-Total	0.00127	0.00122	0.00123	0.00122	0.00125	0.00123	0.00117	0.00091	0.00102	0.00081	0.00072	0.00083	0.00085
Magnesium (Mg)-Total	5.14	5.04	4.96	5.02	5.02	4.99	5	4.09	4.11	4.07	4.17	4.1	4.16
Manganese (Mn)-Total	0.00197	0.00206	0.00199	0.00199	0.002	0.002	0.00194	0.00567	0.00264	0.00259	0.00295	0.00243	0.00328
Molybdenum (Mo)-Total	0.000547	0.000572	0.000602	0.000558	0.00056	0.000505	0.00054	0.000504	0.000489	0.000481	0.000449	0.000439	0.000419
Nickel (Ni)-Total	0.000252	0.000271	0.000285	0.000302	0.000285	0.000294	0.000263	0.000268	0.000248	0.000217	0.000249	0.000208	0.000322
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.643	0.653	0.625	0.626	0.633	0.622	0.621	0.565	0.61	0.585	0.588	0.596	0.596
Selenium (Se)-Total	**0.000282**	**0.00024**	**0.000255**	**0.00025**	**0.000238**	**0.000256**	**0.000247**	**0.00024**	**0.000229**	**0.000232**	**0.000239**	**0.00021**	**0.00024**
Silicon (Si)-Total	2.14	2.17	2.15	2.18	2.17	2.17	2.17	2.25	2.21	2.17	2.22	2.19	2.22
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	2	1.75	1.76	1.75	1.77	1.76	1.75	1.21	1.2	1.16	1.2	1.1	1.24
Strontium (Sr)-Total	0.11	0.116	0.115	0.112	0.113	0.103	0.109	0.103	0.101	0.1	0.0971	0.0953	0.0911
Thallium (Tl)-Total	0.0000087	0.0000294	0.0000285	0.0000293	0.0000279	0.0000239	0.0000276	0.0000075	0.0000065	0.0000047	0.0000058	0.0000051	0.0000093
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00009	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00303	0.00096	0.00083	0.00153	0.00066	0.00246
Uranium (U)-Total	0.00053	0.000564	0.000566	0.000544	0.000547	0.000499	0.000536	0.000437	0.000428	0.000423	0.0004	0.000399	0.000399
Vanadium (V)-Total	0.000112	0.00012	0.000134	0.000119	0.00013	0.000132	0.000127	0.000238	0.000174	0.000182	0.000211	0.00017	0.000239
Zinc (Zn)-Total	0.00163	0.00139	0.00187	0.00153	0.00136	0.00143	0.00148	**0.012**	0.00178	0.00176	0.00183	0.00166	0.00399
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals													
Dissolved Metals Filtration Location													
Aluminum (Al)-Dissolved	0.00328	0.00373	0.00317	0.00369	0.00392	0.00370	0.00365	0.0149	0.0146	0.0137	0.0146	0.0119	0.0191
Antimony (Sb)-Dissolved	0.000069	0.000072	0.000072	0.000067	0.000069	0.000061	0.000068	0.000078	0.000078	0.000066	0.000072	0.000060	0.000078
Arsenic (As)-Dissolved	0.000266	0.000285	0.000262	0.000273	0.000269	0.000263	0.000249	0.000221	0.000219	0.000200	0.000216	0.000181	0.000221
Barium (Ba)-Dissolved	0.0223	0.0223	0.0224	0.0224	0.0222	0.0222	0.0224	0.0186	0.0193	0.0192	0.0187	0.0160	0.0200
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000020	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000081	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0060	<0.0050
Cadmium (Cd)-Dissolved	0.0000280	0.0000228	0.0000199	0.0000224	0.0000208	0.0000203	0.0000190	0.0000133	0.0000118	0.0000140	0.0000120	0.0000105	0.0000147
Calcium (Ca)-Dissolved	21.3	20.8	20.7	20.7	20.6	20.8	20.7	17.1	17.3	17.3	17.5	17.4	17.4
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013
Cobalt (Co)-Dissolved	<0.0000050	0.0000066	0.0000054	0.0000055	<0.0000050	0.0000073	0.0000082	0.0000084	0.0000088	0.0000071	0.0000096	<0.0000050	0.0000080
Copper (Cu)-Dissolved	0.00029	0.00029	0.00027	0.00028	0.00027	0.00026	0.00028	0.00046	0.00039	0.00043	0.00037	0.00046	0.00043
Iron (Fe)-Dissolved	0.0012	0.0019	0.0017	0.0018	0.0019	0.0018	0.0017	0.0020	0.0017	0.0020	0.0017	0.0012	0.0040
Lead (Pb)-Dissolved	0.0000194	0.0000212	0.0000174	0.0000148	0.0000168	0.0000197	0.0000157	0.0000183	0.0000342	0.0000130	0.0000132	0.0000104	0.0000166
Lithium (Li)-Dissolved	0.00120	0.00122	0.00124	0.00131	0.00124	0.00119	0.00122	0.00086	0.00085	0.00081	0.00082	0.00067	0.00091
Magnesium (Mg)-Dissolved	5.03	4.87	4.89	4.87	4.85	4.85	4.85	3.95	3.97	3.99	4.04	4.03	4.02
Manganese (Mn)-Dissolved	0.000727	0.000624	0.000643	0.000618	0.000632	0.000695	0.000640	0.000104	0.000056	<0.000050	<0.000050	<0.000050	0.000205
Mercury (Hg)-Dissolved	-	<0.000010	-	-	-	-	-	<0.00050	-	-	-	-	-
Molybdenum (Mo)-Dissolved	0.000537	0.000592	0.000583	0.000586	0.000569	0.000574	0.000514	0.000501	0.000515	0.000501	0.000477	0.000453	0.000482
Nickel (Ni)-Dissolved	0.000251	0.000228	0.000259	0.000256	0.000246	0.000238	0.000245	0.000287	0.000228	0.000234	0.000214	0.000186	0.000335
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.666	0.628	0.614	0.616	0.607	0.600	0.609	0.549	0.586	0.564	0.580	0.570	0.565
Selenium (Se)-Dissolved	0.000245	0.000258	0.000231	0.000236	0.000224	0.000225	0.000222	0.000223	0.000244	0.000235	0.000198	0.000188	0.000232
Silicon (Si)-Dissolved	2.03	2.10	2.10	2.08	2.07	2.09	2.08	2.10	2.09	2.10	2.12	2.13	2.10
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	2.01	1.75	1.72	1.73	1.72	1.74	1.76	1.21	1.23	1.18	1.20	1.05	1.26
Strontium (Sr)-Dissolved	0.110	0.114	0.113	0.112	0.111	0.110	0.100	0.103	0.101	0.103	0.102	0.0913	0.103
Thallium (Tl)-Dissolved	0.0000092	0.0000293	0.0000285	0.0000296	0.0000279	0.0000285	0.0000276	0.0000056	0.0000070	0.0000051	0.0000054	0.0000049	0.0000054
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000044
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000527	0.000566	0.000576	0.000564	0.000561	0.000551	0.000506	0.000445	0.000431	0.000418	0.000434	0.000392	0.000459
Vanadium (V)-Dissolved	0.000105	0.000104	0.000107	0.000099	0.000105	0.000106	0.000105	0.000147	0.000141	0.000140	0.000140	0.000115	0.000160
Zinc (Zn)-Dissolved	0.00115	0.00105	0.00102	0.00110	0.00103	0.00094	0.00129	0.00119	0.00089	0.00126	0.00079	0.00105	0.00101
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	BIRCHBANK R SH	BIRCHBANK R 1M DEEP	BIRCHBANK R 1M ABOVE BED	BIRCHBANK L 1M ABOVE BED	BIRCHBANK L 1M DEEP	BIRCHBANK L SH	STONEY CK R SH	STONEY CK R 1M DEEP	STONEY CK R 1M ABOVE BED	STONEY CK L 1M ABOVE BED	STONEY CK L 1M DEEP	STONEY CK L SH
Site	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**
TTS_Dist_CII	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**
Date Sampled	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12
Time Sampled	08:47	09:20	09:58	10:30	11:00	11:34	17:20	17:40	17:55	18:05	18:20	18:35
ALS Sample ID	L1215909-1	L1215909-2	L1215909-3	L1215909-4	L1215909-5	L1215909-6	L1215909-12	L1215909-13	L1215909-14	L1215909-15	L1215909-16	L1215909-17
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests												
Conductivity	113	113	113	113	113	113	111	113	113	113	113	113
Hardness (as CaCO3)	58.0	58.4	57.4	57.9	58.2	59.4	57.8	58.2	58.5	59.0	58.9	58.7
pH	7.92	8.18	8.17	8.24	8.19	8.18	6.92	8.17	8.33	8.24	8.22	8.22
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	58	63	62	61	69	63	66	59	65	54	65	68
Turbidity	0.45	0.44	0.40	0.39	0.32	0.37	0.58	0.78	0.49	0.55	0.55	0.48
Anions and Nutrients												
Alkalinity, Total (as CaCO3)	48.1	48.2	48.2	48.3	48.4	48.0	47.8	47.9	48.1	48.3	48.3	48.4
Ammonia, Total (as N)	0.0062	0.0059	0.0059	0.0061	0.0055	0.0061	0.0122	0.0056	0.0059	0.0064	0.0064	0.0057
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	0.037	0.055	0.055	0.055	0.055	0.055	0.056	0.055	0.055	0.055	0.055	0.055
Nitrate (as N)	0.0593	0.0840	0.0815	0.0831	0.0817	0.0837	0.0840	0.0834	0.0828	0.0831	0.0825	0.0842
Nitrite (as N)	<0.0010	0.0012	<0.0010	0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.072	0.077	0.078	0.070	0.073	0.090	0.075	0.078	0.080	0.079	0.082	0.082
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	0.0023	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0039	0.0045	0.0039	0.0039	0.0043	0.0041	0.0046	0.0039	0.0037	0.0050	0.0038	0.0061
Sulfate (SO4)	5.67	8.86	8.87	8.88	8.86	8.87	9.00	8.91	8.89	8.89	8.90	8.93
Total Metals												
Mercury (Hg)-Total	0.00122	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00066	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Total Metals (Undigested)												
Aluminum (Al)-Total	0.0158	0.0149	0.0165	0.0153	0.0152	0.0153	0.0149	0.0168	0.0157	0.0164	0.0148	0.0171
Antimony (Sb)-Total	0.000029	0.000025	0.000025	0.000025	0.000029	0.000028	0.000037	0.000026	0.000025	0.000027	0.000024	0.000028
Arsenic (As)-Total	0.000152	0.000152	0.000171	0.000163	0.000163	0.000157	0.000178	0.000168	0.000166	0.000148	0.000174	0.000173
Barium (Ba)-Total	0.0156	0.0156	0.0160	0.0164	0.0158	0.0163	0.0162	0.0157	0.0165	0.0153	0.0164	0.0163
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000088	0.0000071	0.0000085	0.0000055	0.0000062	0.0000065	0.0000078	0.0000063	0.0000061	0.0000067	0.0000066	0.0000711
Calcium (Ca)-Total	16.8	17.0	17.1	17.1	17.3	17.3	16.9	16.8	17.2	17.4	17.5	17.6
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000111	0.0000128	0.0000126	0.0000131	0.0000127	0.0000121	0.0000117	0.0000101	0.0000142	0.0000140	0.0000120	0.0000128
Copper (Cu)-Total	0.00035	0.00033	0.00033	0.00033	0.00032	0.00033	0.00032	0.00034	0.00033	0.00028	0.00030	0.00030
Iron (Fe)-Total	0.0096	0.0084	0.0109	0.0105	0.0095	0.0089	0.0094	0.0088	0.0098	0.0098	0.0095	0.0106
Lead (Pb)-Total	0.0000459	0.0000417	0.0000530	0.0000455	0.0000414	0.0000461	0.000109	0.0000392	0.0000409	0.0000413	0.0000383	0.0000456
Lithium (Li)-Total	0.00096	0.00094	0.00081	0.00084	0.00090	0.00092	0.00094	0.00074	0.00100	0.00097	0.00094	0.00111
Magnesium (Mg)-Total	3.55	3.64	3.66	3.68	3.70	3.67	3.58	3.58	3.80	3.71	3.70	3.68
Manganese (Mn)-Total	0.00197	0.00215	0.00204	0.00196	0.00193	0.00210	0.00209	0.00214	0.00214	0.00200	0.00207	0.00212
Molybdenum (Mo)-Total	0.000475	0.000484	0.000492	0.000505	0.000479	0.000497	0.000508	0.000454	0.000491	0.000491	0.000487	0.000511
Nickel (Ni)-Total	0.000334	0.000336	0.000360	0.000357	0.000340	0.000342	0.000323	0.000332	0.000332	0.000341	0.000332	0.000340
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.670	0.675	0.681	0.675	0.659	0.662	0.643	0.763	0.747	0.780	0.733	0.721
Selenium (Se)-Total	0.000156	0.000163	0.000158	0.000156	0.000152	0.000171	0.000164	0.000155	0.000172	0.000167	0.000181	0.000150
Silicon (Si)-Total	1.58	1.63	1.63	1.65	1.62	1.60	1.59	1.60	1.67	1.64	1.61	1.61
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.07	1.09	1.09	1.08	1.07	1.11	1.08	1.13	1.12	1.13	1.15	1.14
Strontium (Sr)-Total	0.0932	0.0943	0.0905	0.0941	0.0929	0.0966	0.0965	0.0902	0.0955	0.0948	0.0942	0.0986
Thallium (Tl)-Total	0.0000035	0.0000027	0.0000039	0.0000035	0.0000029	0.0000033	0.0000034	0.0000037	0.0000035	0.0000033	0.0000033	0.0000036
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	0.00064	0.00051	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000367	0.000366	0.000375	0.000364	0.000355	0.000366	0.000364	0.000349	0.000359	0.000354	0.000357	0.000381
Vanadium (V)-Total	0.000126	0.000111	0.000126	0.000119	0.000115	0.000118	0.000128	0.000122	0.000115	0.000128	0.000118	0.000127
Zinc (Zn)-Total	0.00127	0.00079	0.00119	0.00259	0.00109	0.00376	0.00105	0.00063	0.00179	0.00076	0.00071	0.00097
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals												
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00967	0.00957	0.00949	0.00932	0.00928	0.0103	0.00986	0.00949	0.00968	0.00977	0.00964	0.0101
Antimony (Sb)-Dissolved	0.000030	0.000026	0.000027	0.000030	0.000029	0.000029	0.000036	0.000026	0.000031	0.000025	0.000028	0.000025
Arsenic (As)-Dissolved	0.000168	0.000172	0.000166	0.000173	0.000172	0.000156	0.000162	0.000165	0.000154	0.000167	0.000162	0.000169
Barium (Ba)-Dissolved	0.0159	0.0158	0.0155	0.0161	0.0153	0.0158	0.0159	0.0158	0.0160	0.0160	0.0161	0.0160
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000128	0.0000059	0.0000062	<0.0000050	<0.0000050	0.0000052	0.0000088	0.0000066	<0.0000050	<0.0000050	<0.0000050	0.0000054
Calcium (Ca)-Dissolved	17.2	17.2	17.0	17.1	17.3	17.6	17.1	17.1	17.2	17.5	17.5	17.4
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000082	0.0000067	0.0000052	0.0000054	0.0000103	0.0000070	0.0000078	0.0000051	0.0000075	0.0000063	0.0000054	0.0000075
Copper (Cu)-Dissolved	0.00026	0.00025	0.00026	0.00023	0.00025	0.00024	0.00025	0.00025	0.00023	0.00022	0.00023	0.00023
Iron (Fe)-Dissolved	0.0020	0.0015	0.0020	0.0015	0.0017	0.0019	0.0016	0.0016	0.0018	0.0016	0.0014	0.0014
Lead (Pb)-Dissolved	0.0000478	0.0000292	0.0000179	0.0000155	0.0000095	0.0000160	0.0000257	0.0000172	0.0000163	0.0000209	0.0000102	0.0000151
Lithium (Li)-Dissolved	0.00094	0.00101	0.00097	0.00078	0.00085	0.00083	0.00079	0.00082	0.00087	0.00099	0.00081	0.00081
Magnesium (Mg)-Dissolved	3.65	3.73	3.65	3.69	3.66	3.74	3.65	3.76	3.76	3.71	3.69	3.69
Manganese (Mn)-Dissolved	0.000802	0.000682	0.000701	0.000719	0.000634	0.000649	0.000782	0.000854	0.000732	0.000742	0.000791	0.000712
Mercury (Hg)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	0.00161	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Molybdenum (Mo)-Dissolved	0.000511	0.000454	0.000517	0.000496	0.000496	0.000485	0.000509	0.000498	0.000515	0.000488	0.000493	0.000489
Nickel (Ni)-Dissolved	0.000338	0.000377	0.000312	0.000305	0.000320	0.000312	0.000328	0.000327	0.000377	0.000332	0.000299	0.000315
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.679	0.704	0.655	0.670	0.680	0.662	0.649	0.774	0.712	0.742	0.750	0.714
Selenium (Se)-Dissolved	0.000155	0.000169	0.000153	0.000145	0.000156	0.000153	0.000176	0.000175	0.000170	0.000161	0.000152	0.000168
Silicon (Si)-Dissolved	1.57	1.67	1.61	1.61	1.59	1.62	1.62	1.65	1.66	1.61	1.60	1.61
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.12	1.09	1.09	1.09	1.05	1.08	1.09	1.11	1.12	1.09	1.13	1.16
Strontium (Sr)-Dissolved	0.0937	0.0875	0.0977	0.0946	0.0970	0.0943	0.0943	0.0936	0.0953	0.0931	0.0933	0.0943
Thallium (Tl)-Dissolved	0.0000033	0.0000032	0.0000035	0.0000031	0.0000035	0.0000036	0.0000061	0.0000035	0.0000045	0.0000035	0.0000029	0.0000031
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000370	0.000370	0.000374	0.000379	0.000368	0.000377	0.000373	0.000369	0.000374	0.000360	0.000376	0.000386
Vanadium (V)-Dissolved	0.000116	0.000122	0.000114	0.000113	0.000121	0.000103	0.000107	0.000117	0.000125	0.000116	0.000093	0.000114
Zinc (Zn)-Dissolved	0.00352	0.00268	0.00188	0.00268	0.00152	0.00190	0.00080	0.00077	0.00069	0.00098	0.00081	0.00103
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

Sample ID	NEW BRIDGE R SH	NEW BRIDGE R 1M DEEP	NEW BRIDGE R 1M ABOVE BED	NEW BRIDGE L 1M ABOVE BED	NEW BRIDGE L 1M DEEP	NEW BRIDGE L SH	OLD BRIDGE R SH	OLD BRIDGE R 1M DEEP	OLD BRIDGE R 1M ABOVE BED	OLD BRIDGE L 1M ABOVE BED	OLD BRIDGE L 1M DEEP	OLD BRIDGE L SH	WANETA R SH	WANETA R 1M DEEP	WANETA R 1M ABOVE BED	WANETA L 1M ABOVE BED	WANETA L 1M DEEP	WANETA L SH	BIRCHBANK R SH	BIRCHBANK R 1M DEEP	BIRCHBANK R 1M ABOVE BED	BIRCHBANK L 1M ABOVE BED	BIRCHBANK L 1M DEEP
Site	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**bb**	**bb**	**bb**	**bb**	**bb**
Sample	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**
TTS_Dist_CII	**230**	**230**	**230**	**230**	**230**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**
Date Sampled	26-SEP-12	26-SEP-12	26-SEP-12	26-SEP-12	26-SEP-12	26-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	25-SEP-12	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13
Time Sampled	08:00	08:30	09:00	09:25	09:38	10:00	15:55	16:05	16:20	16:35	16:55	17:05	13:45	14:15	14:28	14:40	14:51	15:05	12:10	12:32	12:45	12:55	13:05
ALS Sample ID	L1215909-18	L1215909-19	L1215909-20	L1215909-21	L1215909-22	L1215909-23	L1215909-24	L1215909-25	L1215909-26	L1215909-27	L1215909-28	L1215909-29	L1215909-30	L1215909-31	L1215909-32	L1215909-33	L1215909-34	L1215909-35	L1271152-1	L1271152-2	L1271152-3	L1271152-4	L1271152-5
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																							
Conductivity	139	114	114	113	114	115	118	113	116	113	114	116	115	115	113	115	115	115	140	139	139	139	138
Hardness (as CaCO3)	63.4	58.9	58.3	57.6	57.4	57.9	57.9	57.5	59.4	58.1	57.8	58.5	58.7	59.1	57.6	57.9	59.2	58.0	70.2	70.4	69.6	70.2	70.5
pH	8.19	8.21	8.22	8.27	8.23	8.21	8.22	8.28	8.23	8.29	8.22	8.24	8.20	8.20	6.90	8.17	8.29	8.31	8.09	8.06	8.05	8.05	8.05
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	81	67	61	64	66	66	65	65	71	65	69	71	69	65	65	65	66	65	86	86	79	84	82
Turbidity	0.62	0.46	0.44	0.48	0.48	0.44	0.64	0.52	0.45	0.46	0.54	0.50	0.68	0.53	0.62	0.55	0.57	0.73	0.65	0.54	0.60	0.47	0.56
Anions and Nutrients																							
Alkalinity, Total (as CaCO3)	48.5	48.4	48.3	48.1	47.7	45.2	48.1	47.9	48.0	48.2	48.3	48.3	44.3	47.9	47.8	48.4	48.5	48.5	61.9	56.1	68.6	67.2	67.6
Ammonia, Total (as N)	0.0446	0.0074	0.0070	0.0085	0.0088	0.0123	0.0153	0.0069	0.0101	0.0071	0.0073	0.0113	0.0098	0.0098	0.0096	0.0103	0.0096	0.0098	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.78	0.77	0.77	0.77	0.77
Fluoride (F)	0.099	0.055	0.055	0.055	0.055	0.055	0.065	0.055	0.059	0.055	0.055	0.056	0.057	0.057	0.057	0.057	0.057	0.057	0.065	0.064	0.065	0.065	0.065
Nitrate (as N)	0.104	0.0859	0.0859	0.0877	0.0892	0.0910	0.0891	0.0842	0.0856	0.0829	0.0833	0.0962	0.0859	0.0851	0.0847	0.0843	0.0845	0.0860	0.142	0.146	0.144	0.146	0.145
Nitrite (as N)	0.0014	<0.0010	0.0012	0.0013	0.0012	0.0012	0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0013	0.0010	0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0017
Total Kjeldahl Nitrogen	0.112	0.076	0.077	0.078	0.079	0.102	0.101	0.094	0.100	0.089	0.088	0.094	0.095	0.085	0.090	0.095	0.089	0.097	0.062	<0.050	0.065	0.056	0.058
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	0.0021	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0031	0.0030	0.0033	0.0043	0.0028
Phosphorus (P)-Total	0.0044	0.0034	0.0037	0.0037	0.0042	0.0043	0.0042	0.0042	0.0039	0.0036	0.0044	0.0042	0.0041	0.0041	0.0041	0.0045	0.0043	0.0042	0.0040	0.0038	0.0039	0.0038	0.0039
Sulfate (SO4)	19.5	8.91	8.89	8.93	8.94	9.24	11.0	8.93	9.72	8.90	8.91	9.41	9.32	9.33	9.34	9.37	9.39	9.40	11.6	11.6	11.5	11.6	11.6
																			1.51	1.22	1.22	1.35	1.21
Total Metals																							
Mercury (Hg)-Total	0.00500	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00100	<0.00050	0.00100	<0.00050	<0.00050	<0.00050	<0.0050	<0.00050	0.00100	0.00100	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Total Metals (Undigested)																							
Aluminum (Al)-Total	0.0132	0.0172	0.0153	0.0161	0.0164	0.0145	0.0146	0.0148	0.0155	0.0150	0.0149	0.0160	0.0149	0.0161	0.0150	0.0165	0.0148	0.0173	0.00993	0.00975	0.0109	0.00943	0.0118
Antimony (Sb)-Total	0.00213	0.000025	0.000024	0.000023	0.000023	0.000029	0.000341	0.000030	0.000184	0.000029	0.000024	0.000042	0.000137	0.000123	0.000128	0.000131	0.000123	0.000136	0.000040	0.000038	0.000039	0.000036	0.000034
Arsenic (As)-Total	0.000384	0.000172	0.000165	0.000150	0.000153	0.000159	0.000318	0.000163	0.000203	0.000160	0.000174	0.000169	0.000168	0.000172	0.000166	0.000200	0.000179	0.000197	0.000215	0.000214	0.000215	0.000196	0.000196
Barium (Ba)-Total	0.0156	0.0163	0.0166	0.0167	0.0163	0.0163	0.0161	0.0167	0.0164	0.0167	0.0160	0.0161	0.0155	0.0160	0.0159	0.0155	0.0159	0.0157	0.0206	0.0200	0.0203	0.0200	0.0205
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.000906	0.0000294	0.0000092	0.0000072	0.0000068	0.0000086	0.0000940	0.0000111	0.0000434	0.0000144	0.0000466	0.0000276	0.0000283	0.0000276	0.0000288	0.0000266	0.0000277	0.0000257	0.0000092	0.0000096	0.0000182	0.0000183	0.0000098
Calcium (Ca)-Total	18.7	17.1	17.4	17.4	16.9	17.2	17.3	16.9	17.5	17.3	17.4	17.8	17.4	17.2	17.2	17.2	17.4	17.5	20.1	20.2	20.0	19.9	20.0
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000251	0.0000148	0.0000127	0.0000125	0.0000131	0.0000118	0.0000149	0.0000159	0.0000117	0.0000125	0.0000111	0.0000141	0.0000112	0.0000108	0.0000150	0.0000153	0.0000134	0.0000134	0.0000094	0.0000103	0.0000123	0.0000112	0.0000098
Copper (Cu)-Total	0.00122	0.00030	0.00031	0.00030	0.00030	0.00029	0.00039	0.00032	0.00036	0.00030	0.00043	0.00030	0.00049	0.00041	0.00043	0.00043	0.00042	0.00043	0.00034	0.00029	0.00029	0.00045	0.00025
Iron (Fe)-Total	0.0072	0.0098	0.0085	0.0104	0.0085	0.0083	0.0078	0.0098	0.0086	0.0085	0.0091	0.0095	0.0102	0.0091	0.0091	0.0094	0.0092	0.0108	0.0081	0.0083	0.0083	0.0086	0.0079
Lead (Pb)-Total	0.000666	0.0000464	0.0000347	0.0000456	0.0000387	0.0000454	0.000179	0.0000488	0.0000825	0.000105	0.0000685	0.000278	0.000110	0.000118	0.0000897	0.0000908	0.0000900	0.000103	0.0000429	0.0000336	0.0000424	0.0000553	0.0000314
Lithium (Li)-Total	0.00093	0.00067	0.00089	0.00068	0.00074	0.00081	0.00105	0.00064	0.00076	0.00067	0.00084	0.00089	0.00083	0.00080	0.00092	0.00072	0.00070	0.00070	0.00108	0.00114	0.00118	0.00108	0.00109
Magnesium (Mg)-Total	3.64	3.65	3.69	3.71	3.66	3.74	3.62	3.60	3.72	3.68	3.70	3.77	3.70	3.65	3.66	3.63	3.62	3.68	4.84	4.87	4.85	4.83	4.84
Manganese (Mn)-Total	0.00474	0.00214	0.00208	0.00224	0.00218	0.00234	0.00246	0.00204	0.00235	0.00200	0.00207	0.00228	0.00232	0.00221	0.00219	0.00223	0.00204	0.00233	0.00162	0.00148	0.00153	0.00146	0.00147
Molybdenum (Mo)-Total	0.000643	0.000455	0.000486	0.000475	0.000483	0.000484	0.000588	0.000478	0.000511	0.000473	0.000485	0.000479	0.000500	0.000473	0.000525	0.000504	0.000485	0.000500	0.000503	0.000531	0.000510	0.000486	0.000498
Nickel (Ni)-Total	0.000348	0.000344	0.000319	0.000302	0.000328	0.000345	0.000328	0.000337	0.000350	0.000329	0.000313	0.000315	0.000389	0.000360	0.000328	0.000341	0.000322	0.000324	0.000330	0.000316	0.000329	0.000358	0.000368
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.714	0.701	0.669	0.700	0.656	0.686	0.682	0.682	0.711	0.690	0.817	0.747	0.703	0.742	0.697	0.676	0.688	0.694	0.664	0.652	0.630	0.631	0.616
Selenium (Se)-Total	0.000652	0.000167	0.000151	0.000160	0.000168	0.000171	0.000454	0.000195	0.000244	0.000176	0.000160	0.000142	0.000175	0.000184	0.000202	0.000190	0.000203	0.000207	0.000227	0.000201	0.000208	0.000215	0.000227
Silicon (Si)-Total	1.58	1.61	1.61	1.62	1.61	1.61	1.56	1.56	1.59	1.58	1.61	1.63	1.61	1.60	1.59	1.59	1.57	1.59	1.94	1.95	1.95	1.93	1.96
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	4.25	1.08	1.10	1.10	1.07	1.13	1.76	1.13	1.38	1.11	1.08	1.17	1.21	1.23	1.25	1.28	1.27	1.23	1.57	1.55	1.53	1.54	1.53
Strontium (Sr)-Total	0.0927	0.0925	0.0958	0.0886	0.0929	0.0940	0.0959	0.0879	0.0924	0.0928	0.0927	0.0954	0.0923	0.0899	0.0942	0.0942	0.0924	0.0922	0.110	0.110	0.109	0.107	0.112
Thallium (Tl)-Total	0.000248	0.0000040	0.0000029	0.0000034	0.0000031	0.0000029	0.0000519	0.0000042	0.0000199	0.0000035	0.0000025	0.0000048	0.0000125	0.0000105	0.0000113	0.0000107	0.0000117	0.0000114	0.0000025	0.0000025	0.0000026	0.0000024	0.0000020
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00118	0.00096	<0.00050	<0.00050
Uranium (U)-Total	0.000379	0.000352	0.000376	0.000373	0.000364	0.000375	0.000369	0.000363	0.000369	0.000365	0.000373	0.000378	0.000363	0.000367	0.000377	0.000371	0.000369	0.000377	0.000494	0.000485	0.000487	0.000484	0.000485
Vanadium (V)-Total	0.000112	0.000122	0.000108	0.000118	0.000132	0.000122	0.000128	0.000118	0.000125	0.000119	0.000111	0.000130	0.000126	0.000127	0.000134	0.000124	0.000118	0.000124	<0.000050	0.000072	0.000052	0.000064	0.000061
Zinc (Zn)-Total	0.0138	0.00144	<0.00050	0.00082	0.00094	0.00172	0.00255	0.00233	0.00251	0.00099	0.00086	0.00110	0.00217	0.00115	0.00136	0.00158	0.00153	0.00145	0.00225	0.00080	0.00097	0.00115	0.00084
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00024	<0.00010
Dissolved Metals																							
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.0101	0.00976	0.0104	0.00971	0.00956	0.00909	0.00905	0.0102	0.00900	0.0103	0.00961	0.0101	0.0104	0.0108	0.00919	0.00887	0.00961	0.0104	0.00497	0.00522	0.00526	0.00523	0.00488
Antimony (Sb)-Dissolved	0.00211	0.000025	0.000029	0.000026	0.000024	0.000029	0.000355	0.000033	0.000160	0.000026	0.000027	0.000033	0.000130	0.000127	0.000122	0.000124	0.000128	0.000133	0.000042	0.000037	0.000042	0.000038	0.000034
Arsenic (As)-Dissolved	0.000319	0.000149	0.000163	0.000152	0.000167	0.000151	0.000257	0.000166	0.000219	0.000157	0.000145	0.000186	0.000180	0.000168	0.000167	0.000195	0.000174	0.000184	0.000203	0.000192	0.000196	0.000215	0.000199
Barium (Ba)-Dissolved	0.0168	0.0162	0.0161	0.0167	0.0163	0.0162	0.0138	0.0156	0.0156	0.0158	0.0163	0.0162	0.0158	0.0157	0.0158	0.0159	0.0150	0.0163	0.0204	0.0203	0.0210	0.0201	0.0207
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.000900	0.0000282	0.0000090	0.0000078	0.0000058	0.0000081	0.0000697	0.0000091	0.0000364	0.0000064	0.0000072	0.0000173	0.0000232	0.0000229	0.0000242	0.0000244	0.0000214	0.0000235	0.0000069	0.0000070	0.0000063	<0.0000050	0.0000053
Calcium (Ca)-Dissolved	19.2	17.5	17.3	17.1	16.9	17.1	17.2	17.0	17.6	17.3	17.2	17.4	17.4	17.5	17.1	17.2	17.6	17.3	20.1	20.2	19.9	20.1	20.2
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000191	0.0000085	0.0000093	0.0000057	0.0000072	0.0000058	0.0000061	0.0000080	0.0000063	0.0000067	0.0000052	0.0000063	0.0000070	0.0000084	0.0000077	0.0000112	0.0000105	0.0000064	0.0000068	0.0000086	0.0000062	0.0000073	0.0000064
Copper (Cu)-Dissolved	0.00090	0.00023	0.00023	0.00021	0.00046	0.00021	0.00022	0.00023	0.00022	0.00022	0.00022	0.00025	0.00035	0.00026	0.00025	0.00028	0.00024	0.00027	0.00027	0.00021	0.00021	0.00020	0.00021
Iron (Fe)-Dissolved	0.0017	0.0016	0.0015	0.0014	0.0023	0.0014	0.0013	0.0015	0.0014	0.0016	0.0014	0.0016	0.0018	0.0018	0.0014	0.0019	0.0015	0.0016	0.0020	0.0020	0.0019	0.0019	0.0020
Lead (Pb)-Dissolved	0.000407	0.0000559	0.0000100	0.0000070	0.0000108	0.0000101	0.0000632	0.0000129	0.0000383	0.0000207	0.0000140	0.0000731	0.0000320	0.0000578	0.0000192	0.000132	0.0000212	0.0000288	0.0000090	0.0000195	0.0000090	0.0000067	0.0000091
Lithium (Li)-Dissolved	0.00105	0.00100	0.00080	0.00082	0.00070	0.00076	0.00068	0.00072	0.00081	0.00075	0.00089	0.00109	0.00092	0.00083	0.00076	0.00099	0.00084	0.00071	0.00106	0.00116	0.00121	0.00110	0.00114
Magnesium (Mg)-Dissolved	3.74	3.69	3.67	3.64	3.66	3.68	3.61	3.64	3.76	3.63	3.63	3.69	3.68	3.74	3.61	3.63	3.68	3.61	4.85	4.87	4.81	4.83	4.89
Manganese (Mn)-Dissolved	0.00357	0.000727	0.000661	0.000744	0.000836	0.000882	0.00119	0.000752	0.00103	0.000817	0.000874	0.000991	0.000824	0.000771	0.000838	0.000801	0.000813	0.000854	0.000859	0.000829	0.000772	0.000821	0.000804
Mercury (Hg)-Dissolved	0.00100	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Molybdenum (Mo)-Dissolved	0.000643	0.000503	0.000489	0.000479	0.000467	0.000486	0.000576	0.000470	0.000505	0.000486	0.000470	0.000451	0.000521	0.000514	0.000498	0.000490	0.000530	0.000499	0.000509	0.000518	0.000508	0.000506	0.000504
Nickel (Ni)-Dissolved	0.000340	0.000347	0.000281	0.000300	0.000331	0.000327	0.000262	0.000317	0.000297	0.000315	0.000319	0.000302	0.000401	0.000320	0.000323	0.000311	0.000307	0.000327	0.000306	0.000337	0.000327	0.000319	0.000327
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.736	0.684	0.684	0.648	0.652	0.658	0.757	0.656	0.670	0.658	0.753	0.716	0.712	0.712	0.691	0.714	0.709	0.684	0.658	0.647	0.636	0.650	0.633
Selenium (Se)-Dissolved	0.000603	0.000173	0.000178	0.000158	0.000176	0.000174	0.000447	0.000174	0.000259	0.000160	0.000162	0.000168	0.000180	0.000197	0.000193	0.000205	0.000224	0.000200	0.000205	0.000225	0.000211	0.000205	0.000216
Silicon (Si)-Dissolved	1.63	1.61	1.59	1.58	1.60	1.59	1.56	1.56	1.61	1.56	1.57	1.58	1.59	1.61	1.57	1.57	1.56	1.54	1.92	1.94	1.92	1.94	1.95
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	4.22	1.12	1.10	1.06	1.10	1.12	1.57	1.12	1.34	1.12	1.14	1.20	1.19	1.26	1.22	1.22	1.17	1.30	1.54	1.63	1.56	1.56	1.50
Strontium (Sr)-Dissolved	0.0963	0.0945	0.0941	0.0939	0.0924	0.0923	0.0897	0.0908	0.0928	0.0911	0.0901	0.0913	0.0960	0.0922	0.0938	0.0909	0.0889	0.0954	0.110	0.109	0.112	0.110	0.110
Thallium (Tl)-Dissolved	0.000260	0.0000036	0.0000060	0.0000037	0.0000031	0.0000036	0.0000494	0.0000040	0.0000204	0.0000033	0.0000035	0.0000042	0.0000106	0.0000104	0.0000093	0.0000120	0.0000106	0.0000112	<0.0000020	0.0000056	0.0000024	0.0000024	0.0000023
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000390	0.000364	0.000374	0.000369	0.000368	0.000384	0.000377	0.000372	0.000371	0.000365	0.000350	0.000380	0.000370	0.000372	0.000372	0.000366	0.000354	0.000389	0.000471	0.000493	0.000491	0.000487	0.000483
Vanadium (V)-Dissolved	0.000108	0.000088	0.000098	0.000107	0.000112	0.000097	0.000087	0.000103	0.000096	0.000108	0.000107	0.000109	0.000117	0.000107	0.000113	0.000112	0.000099	0.000098	<0.000050	<0.000050	<0.000050	<0.000050	0.000051
Zinc (Zn)-Dissolved	0.0143	0.00160	0.00061	0.00109	0.00107	0.00154	0.00225	0.00110	0.00142	0.00112	0.00084	0.00104	0.00207	0.00179	0.00130	0.00185	0.00170	0.00170	0.00264	0.00103	0.00118	0.00127	0.00082
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
																			<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	BIRCHBANK L SH	STONEY CK R SH	STONEY CK R 1M DEEP	STONEY CK R 1M ABOVE BED	STONEY CK L 1M ABOVE BED	STONEY CK L 1M DEEP	STONEY CK L SH	NEW BRIDGE R SH
Site	**bb**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**nb**
Sample	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**
TTS_Dist_CII	**-9720**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**230**
Date Sampled	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	19-FEB-13
Time Sampled	18:17	13:37	13:45	13:55	14:05	14:15	14:24	08:29
ALS Sample ID	L1271152-6	L1271152-12	L1271152-13	L1271152-14	L1271152-15	L1271152-16	L1271152-17	L1271152-18
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	138	139	139	139	139	139	139	166
Hardness (as CaCO3)	69.4	69.3	68.8	69.9	69.1	69.0	68.7	73.8
pH	8.06	7.97	8.02	8.03	8.02	8.04	8.04	8.03
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	77	73	76	79	87	80	77	94
Turbidity	0.54	0.52	0.52	0.50	0.56	0.42	0.44	0.62
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	65.8	66.9	67.0	62.4	64.3	63.4	65.0	65.6
Ammonia, Total (as N)	<0.0050	0.0100	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0756
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.78	0.80	0.78	0.78	0.79	0.77	0.78	1.18
Fluoride (F)	0.065	0.066	0.065	0.065	0.066	0.065	0.065	0.152
Nitrate (as N)	0.145	0.148	0.146	0.146	0.147	0.146	0.146	0.172
Nitrite (as N)	0.0013	0.0018	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.060	0.059	0.051	<0.050	0.052	0.054	0.052	0.127
Phosphorus (P)-Total Dissolved	0.0037	0.0028	0.0025	0.0036	0.0030	0.0030	0.0028	0.0037
Phosphorus (P)-Total	0.0039	0.0039	0.0040	0.0033	0.0041	0.0035	0.0032	0.0039
Sulfate (SO4)	11.5	11.7	11.6	11.6	11.6	11.6	11.6	22.9
	1.32	1.15	1.27	1.24	1.16	1.23	1.23	1.15
Total Metals								
Mercury (Hg)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
Total Metals (Undigested)								
Aluminum (Al)-Total	0.0115	0.0108	0.00995	0.00978	0.0106	0.0104	0.00916	0.0117
Antimony (Sb)-Total	0.000043	0.000056	0.000035	0.000035	0.000036	0.000032	0.000035	0.00165
Arsenic (As)-Total	0.000206	0.000549	0.000202	0.000223	0.000220	0.000207	0.000215	0.000954
Barium (Ba)-Total	0.0203	0.0209	0.0211	0.0210	0.0204	0.0210	0.0207	0.0208
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000064	0.0000287	0.0000084	0.0000071	0.0000091	0.0000084	0.0000081	0.000902
Calcium (Ca)-Total	19.9	19.8	19.8	19.8	19.8	19.5	20.1	21.2
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000092	0.0000093	0.0000093	0.0000118	0.0000084	0.0000098	0.0000114	0.0000288
Copper (Cu)-Total	0.00028	0.00025	0.00021	0.00021	0.00023	0.00022	0.00020	0.00081
Iron (Fe)-Total	0.0081	0.0076	0.0076	0.0076	0.0084	0.0080	0.0077	0.0090
Lead (Pb)-Total	0.0000305	0.0000519	0.0000500	0.0000282	0.0000302	0.0000299	0.0000324	0.000887
Lithium (Li)-Total	0.00111	0.00108	0.00101	0.00096	0.00097	0.00100	0.00094	0.00112
Magnesium (Mg)-Total	4.79	4.75	4.74	4.77	4.79	4.73	4.84	4.81
Manganese (Mn)-Total	0.00143	0.00157	0.00140	0.00145	0.00139	0.00139	0.00135	0.00580
Molybdenum (Mo)-Total	0.000506	0.000501	0.000487	0.000492	0.000504	0.000503	0.000505	0.000932
Nickel (Ni)-Total	0.000331	0.000340	0.000321	0.000325	0.000330	0.000340	0.000311	0.000356
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.631	0.596	0.604	0.640	0.623	0.613	0.626	0.723
Selenium (Se)-Total	0.000211	0.000210	0.000211	0.000205	0.000215	0.000209	0.000241	0.00143
Silicon (Si)-Total	1.94	1.95	1.92	1.91	1.92	1.90	1.94	1.94
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.51	1.48	1.52	1.50	1.47	1.47	1.52	5.18
Strontium (Sr)-Total	0.113	0.110	0.110	0.108	0.111	0.109	0.109	0.113
Thallium (Tl)-Total	<0.0000020	<0.0000020	0.0000021	0.0000031	0.0000022	0.0000025	0.0000022	0.000234
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000492	0.000498	0.000486	0.000496	0.000487	0.000493	0.000502	0.000506
Vanadium (V)-Total	0.000069	0.000081	0.000072	0.000066	0.000088	0.000085	0.000100	0.000108
Zinc (Zn)-Total	0.00102	0.00180	0.00080	0.00100	0.00107	0.00077	0.00070	0.0159
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00527	0.00552	0.00501	0.00491	0.00515	0.00530	0.00537	0.00582
Antimony (Sb)-Dissolved	0.000034	0.000053	0.000038	0.000038	0.000032	0.000037	0.000033	0.00165
Arsenic (As)-Dissolved	0.000205	0.000530	0.000216	0.000216	0.000230	0.000209	0.000203	0.000956
Barium (Ba)-Dissolved	0.0203	0.0207	0.0209	0.0202	0.0204	0.0199	0.0201	0.0201
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0051
Cadmium (Cd)-Dissolved	0.0000058	0.0000250	0.0000069	0.0000082	0.0000059	0.0000055	0.0000059	0.000875
Calcium (Ca)-Dissolved	19.9	19.9	19.7	20.0	19.8	19.8	19.7	21.5
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000064	0.0000051	0.0000062	0.0000073	0.0000061	0.0000067	0.0000056	0.0000241
Copper (Cu)-Dissolved	0.00020	0.00020	0.00016	0.00016	0.00017	0.00016	0.00016	0.00060
Iron (Fe)-Dissolved	0.0018	0.0019	0.0020	0.0019	0.0018	0.0019	0.0020	0.0022
Lead (Pb)-Dissolved	0.0000063	0.0000178	0.0000096	0.0000064	<0.0000050	0.0000055	0.0000073	0.000570
Lithium (Li)-Dissolved	0.00102	0.00096	0.00104	0.00103	0.00099	0.00094	0.00092	0.00109
Magnesium (Mg)-Dissolved	4.78	4.78	4.74	4.83	4.78	4.76	4.75	4.89
Manganese (Mn)-Dissolved	0.000766	0.000859	0.000739	0.000776	0.000746	0.000746	0.000688	0.00478
Mercury (Hg)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020
Molybdenum (Mo)-Dissolved	0.000511	0.000496	0.000512	0.000507	0.000494	0.000503	0.000488	0.000963
Nickel (Ni)-Dissolved	0.000310	0.000328	0.000300	0.000324	0.000300	0.000289	0.000288	0.000332
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.618	0.621	0.591	0.648	0.612	0.603	0.610	0.732
Selenium (Se)-Dissolved	0.000206	0.000230	0.000194	0.000215	0.000205	0.000206	0.000215	0.00140
Silicon (Si)-Dissolved	1.91	1.93	1.89	1.92	1.90	1.88	1.89	1.94
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	0.0000064	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.50	1.49	1.47	1.49	1.54	1.56	1.53	5.04
Strontium (Sr)-Dissolved	0.110	0.109	0.109	0.111	0.110	0.112	0.111	0.114
Thallium (Tl)-Dissolved	0.0000024	0.0000022	0.0000043	0.0000023	<0.0000020	0.0000024	<0.0000020	0.000245
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000495	0.000480	0.000498	0.000489	0.000489	0.000494	0.000507	0.000524
Vanadium (V)-Dissolved	<0.000050	0.000061	0.000054	0.000075	0.000063	0.000051	0.000071	0.000094
Zinc (Zn)-Dissolved	0.00108	0.00183	0.00071	0.00077	0.00068	0.00090	0.00094	0.0146
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	NEW BRIDGE R 1M DEEP	NEW BRIDGE R 1M ABOVE BED	NEW BRIDGE L 1M ABOVE BED	NEW BRIDGE L 1M DEEP	NEW BRIDGE L SH	OLD BRIDGE R SH	OLD BRIDGE R 1M DEEP	OLD BRIDGE R 1M ABOVE BED
Site	**nb**	**nb**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**
Sample	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**
TTS_Dist_CII	**230**	**230**	**230**	**230**	**1090**	**1090**	**1090**	**1090**
Date Sampled	19-FEB-13	19-FEB-13	19-FEB-13	19-FEB-13	19-FEB-13	19-FEB-13	19-FEB-13	19-FEB-13
Time Sampled	08:42	08:52	09:04	09:17	09:27	09:46	10:13	10:32
ALS Sample ID	L1271152-19	L1271152-20	L1271152-21	L1271152-22	L1271152-23	L1271152-24	L1271152-25	L1271152-26
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	139	140	140	140	143	145	141	141
Hardness (as CaCO3)	70.4	70.9	70.2	69.1	70.8	70.5	69.4	70.4
pH	8.04	8.05	8.04	8.05	8.06	8.06	8.06	8.06
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	77	79	77	77	81	82	81	97
Turbidity	0.49	0.48	0.37	0.50	0.50	0.50	0.45	0.51
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	68.7	71.6	71.4	68.8	72.1	65.8	67.6	70.5
Ammonia, Total (as N)	0.0058	0.0064	0.0078	0.0084	0.0416	0.0227	0.0136	0.0137
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.80	0.80	0.80	0.80	0.85	0.92	0.84	0.84
Fluoride (F)	0.065	0.065	0.065	0.065	0.066	0.079	0.072	0.073
Nitrate (as N)	0.148	0.148	0.150	0.149	0.167	0.156	0.152	0.151
Nitrite (as N)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.052	0.055	0.066	0.066	0.090	0.072	0.055	0.063
Phosphorus (P)-Total Dissolved	0.0034	0.0035	0.0029	0.0032	0.0031	0.0033	0.0026	0.0027
Phosphorus (P)-Total	0.0039	0.0036	0.0036	0.0034	0.0038	0.0035	0.0044	0.0036
Sulfate (SO4)	11.6	11.6	11.7	11.7	12.8	13.5	12.5	12.7
	1.17	1.15	1.25	1.16	1.18	1.18	1.16	0.98
Total Metals								
Mercury (Hg)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0010	<0.00050
Total Metals (Undigested)								
Aluminum (Al)-Total	0.00970	0.00883	0.00891	0.00859	0.0106	0.00917	0.00963	0.0112
Antimony (Sb)-Total	0.000032	0.000038	0.000036	0.000036	0.000036	0.000338	0.000165	0.000191
Arsenic (As)-Total	0.000211	0.000212	0.000206	0.000208	0.000223	0.000383	0.000266	0.000277
Barium (Ba)-Total	0.0202	0.0211	0.0206	0.0196	0.0204	0.0202	0.0204	0.0202
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000153	0.0000092	0.0000071	0.0000112	0.0000131	0.000143	0.0000655	0.0000657
Calcium (Ca)-Total	19.9	20.0	19.9	19.9	20.4	20.3	20.1	20.1
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000108	0.0000081	0.0000098	0.0000087	0.0000125	0.0000124	0.0000130	0.0000109
Copper (Cu)-Total	0.00021	0.00020	0.00020	0.00019	0.00022	0.00032	0.00026	0.00029
Iron (Fe)-Total	0.0078	0.0077	0.0077	0.0063	0.0079	0.0083	0.0079	0.0079
Lead (Pb)-Total	0.0000581	0.0000397	0.0000278	0.0000328	0.0000590	0.000179	0.0000852	0.000106
Lithium (Li)-Total	0.00096	0.00094	0.00089	0.00095	0.00100	0.00094	0.00089	0.00099
Magnesium (Mg)-Total	4.79	4.80	4.75	4.79	4.91	4.83	4.81	4.83
Manganese (Mn)-Total	0.00169	0.00168	0.00173	0.00160	0.00340	0.00249	0.00215	0.00210
Molybdenum (Mo)-Total	0.000480	0.000507	0.000500	0.000509	0.000500	0.000589	0.000537	0.000548
Nickel (Ni)-Total	0.000457	0.000316	0.000324	0.000313	0.000345	0.000335	0.000325	0.000343
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.606	0.606	0.599	0.598	0.618	0.634	0.614	0.618
Selenium (Se)-Total	0.000212	0.000205	0.000238	0.000231	0.000213	0.000422	0.000289	0.000333
Silicon (Si)-Total	1.93	1.93	1.91	1.93	1.95	1.95	1.93	1.94
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.50	1.54	1.51	1.61	1.65	2.18	1.88	1.97
Strontium (Sr)-Total	0.109	0.112	0.110	0.111	0.113	0.112	0.112	0.116
Thallium (Tl)-Total	0.0000027	0.0000023	0.0000021	<0.0000020	0.0000029	0.0000420	0.0000189	0.0000224
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000486	0.000498	0.000500	0.000490	0.000521	0.000487	0.000491	0.000507
Vanadium (V)-Total	0.000106	0.000087	0.000090	0.000098	0.000109	0.000121	0.000103	0.000112
Zinc (Zn)-Total	0.00100	0.00088	0.00068	0.00106	0.00077	0.00360	0.00214	0.00234
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00506	0.00533	0.00459	0.00513	0.00473	0.00479	0.00500	0.00534
Antimony (Sb)-Dissolved	0.000036	0.000036	0.000046	0.000039	0.000040	0.000343	0.000166	0.000184
Arsenic (As)-Dissolved	0.000211	0.000218	0.000219	0.000223	0.000206	0.000358	0.000260	0.000290
Barium (Ba)-Dissolved	0.0203	0.0210	0.0202	0.0199	0.0201	0.0202	0.0203	0.0209
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000150	0.0000096	0.0000073	0.0000084	0.0000146	0.000130	0.0000620	0.0000633
Calcium (Ca)-Dissolved	20.2	20.4	20.1	19.8	20.3	20.3	20.0	20.2
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000065	0.0000055	0.0000068	0.0000062	0.0000077	0.0000095	0.0000088	0.0000067
Copper (Cu)-Dissolved	0.00016	0.00018	0.00014	0.00016	0.00015	0.00025	0.00017	0.00018
Iron (Fe)-Dissolved	0.0020	0.0018	0.0018	0.0019	0.0020	0.0021	0.0021	0.0019
Lead (Pb)-Dissolved	0.0000216	0.0000100	0.0000063	0.0000095	0.0000208	0.0000808	0.0000393	0.0000457
Lithium (Li)-Dissolved	0.00101	0.00092	0.00097	0.00098	0.00086	0.00086	0.00095	0.00089
Magnesium (Mg)-Dissolved	4.84	4.87	4.83	4.77	4.89	4.81	4.76	4.86
Manganese (Mn)-Dissolved	0.00100	0.00103	0.00101	0.00116	0.00267	0.00181	0.00130	0.00138
Mercury (Hg)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.015	<0.00050
Molybdenum (Mo)-Dissolved	0.000523	0.000503	0.000509	0.000512	0.000509	0.000574	0.000547	0.000546
Nickel (Ni)-Dissolved	0.000354	0.000327	0.000299	0.000306	0.000316	0.000322	0.000294	0.000330
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.595	0.617	0.610	0.589	0.627	0.621	0.590	0.607
Selenium (Se)-Dissolved	0.000208	0.000207	0.000201	0.000223	0.000217	0.000436	0.000305	0.000336
Silicon (Si)-Dissolved	1.92	1.95	1.93	1.90	1.92	1.94	1.90	1.93
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	0.0000060	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.56	1.54	1.51	1.57	1.62	2.24	1.82	1.89
Strontium (Sr)-Dissolved	0.111	0.111	0.113	0.113	0.111	0.110	0.117	0.112
Thallium (Tl)-Dissolved	0.0000029	<0.0000020	0.0000024	0.0000048	<0.0000020	0.0000430	0.0000204	0.0000224
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000491	0.000504	0.000496	0.000487	0.000523	0.000496	0.000501	0.000506
Vanadium (V)-Dissolved	0.000070	0.000068	0.000077	0.000086	0.000094	0.000090	0.000079	0.000090
Zinc (Zn)-Dissolved	0.00116	0.00071	0.00066	0.00068	0.00085	0.00364	0.00194	0.00268
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	OLD BRIDGE L 1M ABOVE BED	OLD BRIDGE L 1M DEEP	OLD BRIDGE L SH	WANETA R SH	WANETA R 1M DEEP	WANETA R 1M ABOVE BED	WANETA L 1M ABOVE BED
Site	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**
Sample	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**
TTS_Dist_CII	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**
Date Sampled	19-FEB-13	19-FEB-13	19-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13	18-FEB-13
Time Sampled	10:45	10:57	11:09	15:00	15:10	15:21	15:32
ALS Sample ID	L1271152-27	L1271152-28	L1271152-29	L1271152-30	L1271152-31	L1271152-32	L1271152-33
Matrix	Water	Water	Water	Water	Water	Water	Water
Physical Tests							
Conductivity	139	140	142	139	140	140	141
Hardness (as CaCO3)	69.6	70.6	71.5	71.4	70.1	71.0	70.7
pH	8.05	8.07	7.75	7.95	7.99	8.00	8.04
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	91	90	92	97	91	92	90
Turbidity	0.50	0.46	0.45	0.41	0.50	0.40	0.47
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	69.8	63.4	65.0	64.2	63.2	66.2	64.6
Ammonia, Total (as N)	0.0053	0.0082	0.0277	0.0123	0.0118	0.0123	0.0115
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.80	0.80	1.00	0.81	0.81	0.81	0.82
Fluoride (F)	0.065	0.066	0.066	0.069	0.069	0.069	0.069
Nitrate (as N)	0.150	0.149	0.169	0.152	0.150	0.153	0.150
Nitrite (as N)	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.058	0.056	0.077	0.063	0.073	0.066	0.063
Phosphorus (P)-Total Dissolved	0.0029	0.0033	0.0033	0.0028	0.0029	0.0034	0.0034
Phosphorus (P)-Total	0.0042	0.0038	0.0037	0.0034	0.0037	0.0039	0.0042
Sulfate (SO4)	11.7	11.7	12.9	12.1	12.1	12.1	12.1
	1.07	0.92	1.02	0.87	0.91	0.90	<0.50
Total Metals							
Mercury (Hg)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.012	<0.00050
Total Metals (Undigested)							
Aluminum (Al)-Total	0.00900	0.00869	0.00943	0.0101	0.00908	0.00941	0.0104
Antimony (Sb)-Total	0.000041	0.000030	0.000038	0.000131	0.000130	0.000125	0.000120
Arsenic (As)-Total	0.000206	0.000197	0.000231	0.000281	0.000288	0.000263	0.000261
Barium (Ba)-Total	0.0200	0.0211	0.0209	0.0209	0.0209	0.0213	0.0199
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000095	0.0000098	0.0000176	0.0000373	0.0000354	0.0000367	0.0000382
Calcium (Ca)-Total	20.1	20.3	20.7	20.3	20.2	20.1	20.2
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000102	0.0000100	0.0000115	0.0000105	0.0000107	0.0000122	0.0000126
Copper (Cu)-Total	0.00026	0.00020	0.00020	0.00028	0.00029	0.00031	0.00029
Iron (Fe)-Total	0.0076	0.0075	0.0081	0.0076	0.0074	0.0076	0.0078
Lead (Pb)-Total	0.0000322	0.0000350	0.0000913	0.0000983	0.000121	0.000117	0.000102
Lithium (Li)-Total	0.00100	0.00089	0.00088	0.00085	0.00087	0.00085	0.00080
Magnesium (Mg)-Total	4.84	4.87	4.96	4.84	4.84	4.82	4.85
Manganese (Mn)-Total	0.00168	0.00181	0.00271	0.00182	0.00186	0.00182	0.00189
Molybdenum (Mo)-Total	0.000525	0.000532	0.000499	0.000529	0.000525	0.000527	0.000537
Nickel (Ni)-Total	0.000305	0.000332	0.000324	0.000320	0.000271	0.000321	0.000322
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.615	0.634	0.619	0.614	0.619	0.612	0.614
Selenium (Se)-Total	0.000224	0.000210	0.000215	0.000280	0.000259	0.000261	0.000269
Silicon (Si)-Total	1.94	1.94	1.96	1.94	1.94	1.93	1.95
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.52	1.56	1.67	1.63	1.51	1.61	1.66
Strontium (Sr)-Total	0.111	0.112	0.116	0.114	0.112	0.111	0.116
Thallium (Tl)-Total	0.0000021	0.0000021	0.0000023	0.0000102	0.0000092	0.0000101	0.0000094
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000497	0.000502	0.000532	0.000484	0.000502	0.000493	0.000502
Vanadium (V)-Total	0.000102	0.000106	0.000080	0.000110	0.000098	0.000107	0.000109
Zinc (Zn)-Total	0.00090	0.00096	0.00116	0.00159	0.00145	0.00160	0.00147
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00515	0.00462	0.00490	0.00629	0.00519	0.00545	0.00489
Antimony (Sb)-Dissolved	0.000039	0.000035	0.000037	0.000120	0.000125	0.000125	0.000125
Arsenic (As)-Dissolved	0.000199	0.000206	0.000210	0.000273	0.000281	0.000255	0.000248
Barium (Ba)-Dissolved	0.0205	0.0206	0.0214	0.0206	0.0212	0.0205	0.0211
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000098	0.0000061	0.0000166	0.0000341	0.0000363	0.0000350	0.0000344
Calcium (Ca)-Dissolved	20.0	20.2	20.5	20.5	20.1	20.4	20.3
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000068	0.0000055	0.0000075	0.0000076	0.0000092	0.0000061	0.0000060
Copper (Cu)-Dissolved	0.00016	0.00014	0.00013	0.00023	0.00018	0.00021	0.00024
Iron (Fe)-Dissolved	0.0021	0.0018	0.0018	0.0019	0.0020	0.0020	0.0019
Lead (Pb)-Dissolved	0.0000107	0.0000064	0.0000260	0.0000348	0.0000349	0.0000448	0.0000440
Lithium (Li)-Dissolved	0.00094	0.00085	0.00082	0.00092	0.00081	0.00082	0.00078
Magnesium (Mg)-Dissolved	4.81	4.89	4.95	4.90	4.83	4.87	4.87
Manganese (Mn)-Dissolved	0.00103	0.00113	0.00210	0.00121	0.00123	0.00117	0.00125
Mercury (Hg)-Dissolved	<0.030	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050
Molybdenum (Mo)-Dissolved	0.000516	0.000512	0.000495	0.000543	0.000530	0.000538	0.000526
Nickel (Ni)-Dissolved	0.000285	0.000305	0.000301	0.000324	0.000311	0.000298	0.000313
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.645	0.622	0.618	0.629	0.613	0.619	0.618
Selenium (Se)-Dissolved	0.000206	0.000209	0.000227	0.000274	0.000276	0.000274	0.000240
Silicon (Si)-Dissolved	1.90	1.94	1.93	1.96	1.93	1.94	1.94
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000067	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.57	1.48	1.66	1.66	1.61	1.62	1.57
Strontium (Sr)-Dissolved	0.115	0.113	0.112	0.113	0.114	0.112	0.113
Thallium (Tl)-Dissolved	0.0000029	0.0000021	0.0000020	0.0000094	0.0000117	0.0000096	0.0000093
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000486	0.000497	0.000531	0.000498	0.000499	0.000513	0.000497
Vanadium (V)-Dissolved	0.000084	0.000066	0.000080	0.000103	0.000072	0.000087	0.000092
Zinc (Zn)-Dissolved	0.00086	0.00068	0.00141	0.00153	0.00185	0.00155	0.00167
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	WANETA L 1M DEEP	WANETA L SH	BIRCHBANK R SH	BIRCHBANK R 1M DEEP	BIRCHBANK R 1M ABOVE BED	BIRCHBANK L 1M ABOVE BED	BIRCHBANK L 1M DEEP	BIRCHBANK L SH	STONEY CK R SH	STONEY CK R 1M DEEP	STONEY CK R 1M ABOVE BED	STONEY CK L 1M ABOVE BED	STONEY CK L 1M DEEP	STONEY CK L SH	NEW BRIDGE R SH	NEW BRIDGE R 1M DEEP	NEW BRIDGE R 1M ABOVE BED	NEW BRIDGE L 1M ABOVE BED	NEW BRIDGE L 1M DEEP	NEW BRIDGE L SH	OLD BRIDGE R SH	OLD BRIDGE R 1M DEEP	OLD BRIDGE R 1M ABOVE BED
Site	**wa**	**wa**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**sc**	**sc**	**sc**	**sc**	**sc**	**sc**	**nb**	**nb**	**nb**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**
Sample	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**
TTS_Dist_CII	**15800**	**15800**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**230**	**230**	**230**	**230**	**230**	**1090**	**1090**	**1090**	**1090**
Date Sampled	18-FEB-13	18-FEB-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	15-MAR-13	15-MAR-13	15-MAR-13	15-MAR-13	15-MAR-13	15-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13
Time Sampled	15:41	15:51	11:40	12:00	12:15	12:30	12:45	13:00	13:28	13:40	13:53	14:07	14:18	14:29	08:15	08:38	09:00	09:14	09:27	09:41	16:53	17:05	17:16
ALS Sample ID	L1271152-34	L1271152-35	L1280396-6	L1280396-7	L1280396-8	L1280396-9	L1280396-10	L1280396-11	L1280396-12	L1280396-13	L1280396-14	L1280396-15	L1280396-16	L1280396-17	L1280396-18	L1280396-19	L1280396-20	L1280396-21	L1280396-22	L1280396-23	L1280396-24	L1280396-25	L1280396-26
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																							
Conductivity	140	141	147	147	146	146	147	147	147	147	147	147	145	147	169	146	147	147	147	118	152	149	151
Hardness (as CaCO3)	70.9	69.6	71.1	72.5	70.9	71.7	71.5	70.6	69.3	70.5	70.4	71.2	71.4	71.1	74.0	70.7	70.3	70.7	70.1	67.6	72.1	71.0	72.2
pH	8.05	8.05	8.02	8.03	8.04	8.04	8.04	8.06	8.05	8.06	8.06	8.05	7.82	7.96	8.00	8.03	8.02	8.03	8.05	7.94	8.06	8.06	8.06
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	3.2	3.2	<3.0	<3.0	3.1
Total Dissolved Solids	90	92	81	70	82	85	86	83	84	89	86	84	85	86	97	87	83	81	84	82	85	88	86
Turbidity	0.38	0.32	0.62	0.42	0.47	0.46	0.50	0.45	0.44	0.49	0.44	0.44	0.52	0.36	0.72	0.43	0.54	0.64	0.49	2.39	0.50	0.59	0.44
Anions and Nutrients																							
Alkalinity, Total (as CaCO3)	65.4	69.2	64.2	63.9	64.5	60.1	63.1	62.2	64.8	66.2	62.8	65.1	63.9	63.8	62.1	64.3	64.9	65.4	66.4	45.5	65.0	68.2	66.5
Ammonia, Total (as N)	0.0112	0.0113	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0132	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0838	<0.0050	0.0052	0.0056	0.0054	0.0307	0.0195	0.0104	0.0148
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.83	0.82	0.88	0.88	0.88	0.89	0.90	0.90	0.96	0.89	0.89	0.96	0.90	0.90	1.45	0.89	0.88	0.88	0.88	0.56	1.01	0.94	0.97
Fluoride (F)	0.068	0.069	0.067	0.067	0.067	0.067	0.067	0.067	0.068	0.067	0.067	0.068	0.067	0.067	0.156	0.067	0.067	0.067	0.067	0.089	0.079	0.071	0.074
Nitrate (as N)	0.152	0.150	0.146	0.147	0.147	0.147	0.146	0.146	0.149	0.146	0.146	0.160	0.145	0.146	0.180	0.149	0.149	0.150	0.149	0.0445	0.153	0.149	0.150
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.055	0.061	0.062	0.051	0.057	0.062	0.061	0.060	0.072	0.058	0.062	0.073	0.064	0.065	0.147	0.070	0.071	0.069	0.067	0.107	0.080	0.071	0.082
Phosphorus (P)-Total Dissolved	0.0033	0.0032	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0021	<0.0020	<0.0020	0.0043	0.0045	0.0028	0.0050	0.0046	0.0041	0.0033	0.0038	0.0039	0.0056	0.0047	0.0045	0.0032
Phosphorus (P)-Total	0.0040	0.0039	0.0033	0.0032	0.0032	0.0032	0.0032	0.0040	0.0033	0.0038	0.0034	0.0059	0.0057	0.0061	0.0061	0.0063	0.0059	0.0048	0.0059	0.0123	0.0072	0.0069	0.0068
Sulfate (SO4)	12.1	12.2	11.9	11.9	11.9	11.9	11.9	11.9	12.0	11.9	11.9	11.9	11.9	11.9	21.1	11.9	11.9	11.9	11.9	12.8	13.8	12.6	13.0
	0.93	0.83	1.33	1.30	1.17	1.18	1.34	1.08	0.94	1.11	1.21	1.33	1.37	1.13	0.98	0.91	0.99	0.96	0.95	1.29	0.98	1.03	0.99
Total Metals																							
Mercury (Hg)-Total	<0.00050	<0.0010	<0.00050	<0.0010	<0.00050	<0.00050	<0.012	<0.00050	<0.0010	<0.0040	<0.00050	<0.00050	<0.00050	<0.0010	<0.0040	<0.00050	<0.0010	<0.0020	<0.0010	<0.0020	<0.0010	<0.00050	<0.0010
Total Metals (Undigested)																							
Aluminum (Al)-Total	0.00907	0.0105	0.00868	0.00934	0.00897	0.00940	0.00831	0.0214	0.00873	0.0101	0.0113	0.00864	0.00866	0.00756	0.0126	0.0109	0.0103	0.00999	0.0109	0.0171	0.00887	0.0107	0.00952
Antimony (Sb)-Total	0.000126	0.000118	0.000038	0.000036	0.000032	0.000036	0.000036	0.000036	0.000064	0.000032	0.000035	0.000033	0.000035	0.000036	0.00128	0.000040	0.000036	0.000034	0.000035	0.000436	0.000338	0.000154	0.000200
Arsenic (As)-Total	0.000286	0.000263	0.000212	0.000221	0.000225	0.000212	0.000240	0.000215	0.000792	0.000225	0.000250	0.000214	0.000221	0.000224	0.00109	0.000243	0.000242	0.000251	0.000235	0.000326	0.000414	0.000327	0.000366
Barium (Ba)-Total	0.0205	0.0205	0.0209	0.0204	0.0214	0.0210	0.0208	0.0213	0.0213	0.0214	0.0210	0.0208	0.0209	0.0214	0.0213	0.0209	0.0212	0.0212	0.0214	0.0225	0.0208	0.0212	0.0211
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000064	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000375	0.0000366	0.0000098	0.0000086	0.0000072	0.0000101	0.0000130	0.0000104	0.0000426	0.0000128	0.0000110	0.0000070	0.0000095	0.0000099	0.000856	0.0000160	0.0000133	0.0000137	0.0000091	0.0000595	0.0000816	0.0000371	0.0000579
Calcium (Ca)-Total	20.1	20.2	20.2	20.4	20.7	20.7	20.5	20.2	20.0	21.6	20.1	20.3	20.3	20.1	21.5	20.5	20.4	20.1	20.1	19.6	20.7	20.4	20.5
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000098	0.0000109	0.0000117	0.0000077	0.0000101	0.0000087	0.0000088	0.0000136	0.0000097	0.0000114	0.0000090	0.0000094	0.0000081	0.0000104	0.0000262	0.0000158	0.0000101	0.0000105	0.0000117	0.0000170	0.0000149	0.0000125	0.0000125
Copper (Cu)-Total	0.00030	0.00032	0.00030	0.00026	0.00028	0.00028	0.00036	0.00033	0.00030	0.00030	0.00033	0.00029	0.00028	0.00028	0.00099	0.00029	0.00027	0.00029	0.00028	0.00049	0.00045	0.00035	0.00035
Iron (Fe)-Total	0.0076	0.0084	0.0082	0.0068	0.0077	0.0078	0.0083	0.0112	0.0075	0.0086	0.0078	0.0074	0.0072	0.0067	0.0093	0.0090	0.0082	0.0085	0.0086	0.0154	0.0092	0.0085	0.0085
Lead (Pb)-Total	0.000103	0.000101	0.0000753	0.0000564	0.0000567	0.0000757	0.0000706	0.000115	0.000153	0.0000979	0.0000702	0.0000615	0.0000763	0.0000548	0.00164	0.0000474	0.0000596	0.0000465	0.0000435	0.000991	0.000186	0.0000948	0.000103
Lithium (Li)-Total	0.00076	0.00076	0.00115	0.00120	0.00116	0.00123	0.00131	0.00133	0.00126	0.00130	0.00119	0.00123	0.00124	0.00126	0.00146	0.00129	0.00126	0.00133	0.00132	0.00116	0.00131	0.00139	0.00142
Magnesium (Mg)-Total	4.84	4.85	4.85	4.87	4.98	4.98	4.94	4.84	4.82	4.85	4.84	4.85	4.87	4.84	4.82	4.88	4.88	4.84	4.83	4.37	4.91	4.87	4.87
Manganese (Mn)-Total	0.00193	0.00189	0.00148	0.00133	0.00141	0.00139	0.00145	0.00201	0.00157	0.00149	0.00134	0.00131	0.00133	0.00134	0.00470	0.00167	0.00171	0.00187	0.00187	0.00310	0.00224	0.00192	0.00201
Molybdenum (Mo)-Total	0.000534	0.000509	0.000507	0.000491	0.000484	0.000500	0.000503	0.000515	0.000483	0.000519	0.000511	0.000511	0.000493	0.000500	0.000935	0.000503	0.000510	0.000497	0.000507	0.000595	0.000536	0.000510	0.000518
Nickel (Ni)-Total	0.000300	0.000380	0.000307	0.000291	0.000296	0.000306	0.000336	0.000329	0.000323	0.000300	0.000316	0.000306	0.000307	0.000347	0.000346	0.000311	0.000327	0.000304	0.000313	0.000333	0.000312	0.000290	0.000286
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.628	0.612	0.634	0.629	0.646	0.640	0.634	0.613	0.628	0.666	0.636	0.638	0.639	0.621	0.758	0.657	0.622	0.617	0.611	0.760	0.642	0.644	0.655
Selenium (Se)-Total	0.000247	0.000282	0.000231	0.000230	0.000225	0.000227	0.000199	0.000204	0.000220	0.000209	0.000230	0.000215	0.000225	0.000243	0.00289	0.000225	0.000201	0.000223	0.000220	0.000195	0.000518	0.000329	0.000412
Silicon (Si)-Total	1.95	1.96	2.03	2.05	2.08	2.10	2.05	2.05	2.09	2.04	2.03	2.04	2.05	2.02	2.08	2.11	2.10	2.07	2.07	3.38	2.10	2.08	2.05
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.62	1.61	1.65	1.62	1.62	1.67	1.66	1.69	1.65	1.63	1.64	1.61	1.60	1.64	4.72	1.61	1.62	1.62	1.59	1.73	2.17	1.87	1.94
Strontium (Sr)-Total	0.109	0.110	0.110	0.111	0.111	0.112	0.110	0.113	0.110	0.115	0.111	0.112	0.112	0.110	0.115	0.112	0.113	0.113	0.111	0.117	0.117	0.114	0.113
Thallium (Tl)-Total	0.0000086	0.0000089	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.000228	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000033	0.0000277	0.0000102	0.0000166
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00057	<0.00050	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00064	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000492	0.000512	0.000479	0.000490	0.000484	0.000492	0.000484	0.000493	0.000500	0.000492	0.000497	0.000488	0.000487	0.000495	0.000497	0.000490	0.000502	0.000486	0.000505	0.000451	0.000495	0.000494	0.000496
Vanadium (V)-Total	0.000115	0.000097	0.000096	0.000097	0.000100	0.000103	0.000096	0.000118	0.000120	0.000112	0.000121	0.000106	0.000100	0.000122	0.000121	0.000098	0.000100	0.000118	0.000123	0.000242	0.000130	0.000096	0.000111
Zinc (Zn)-Total	0.00163	0.00168	0.00256	0.00152	0.00106	0.00092	0.00104	0.00146	0.00340	0.00117	0.00105	0.00093	0.00104	0.00140	0.0137	0.00115	0.00118	0.00104	0.00105	0.00326	0.00301	0.00143	0.00164
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																							
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00530	0.00504	0.00464	0.00912	0.00458	0.00467	0.00442	0.00426	0.00541	0.00439	0.00429	0.00464	0.00473	0.00515	0.00643	0.00521	0.00509	0.00518	0.00521	0.00526	0.00558	0.00484	0.00505
Antimony (Sb)-Dissolved	0.000119	0.000114	0.000037	0.000032	0.000036	0.000032	0.000030	0.000035	0.000063	0.000038	0.000040	0.000032	0.000033	0.000038	0.00128	0.000039	0.000039	0.000035	0.000037	0.000431	0.000336	0.000143	0.000213
Arsenic (As)-Dissolved	0.000262	0.000246	0.000241	0.000234	0.000215	0.000237	0.000227	0.000207	0.000789	0.000237	0.000216	0.000215	0.000226	0.000234	0.00107	0.000223	0.000265	0.000219	0.000223	0.000312	0.000446	0.000311	0.000344
Barium (Ba)-Dissolved	0.0204	0.0208	0.0198	0.0213	0.0208	0.0206	0.0203	0.0206	0.0216	0.0206	0.0208	0.0215	0.0205	0.0212	0.0219	0.0202	0.0203	0.0216	0.0208	0.0213	0.0210	0.0210	0.0209
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	0.0051	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000326	0.0000341	0.0000077	0.0000068	0.0000057	0.0000053	0.0000072	0.0000069	0.0000407	0.0000072	0.0000067	0.0000070	0.0000074	0.0000082	0.000856	0.0000139	0.0000121	0.0000075	0.0000080	0.0000497	0.0000725	0.0000395	0.0000481
Calcium (Ca)-Dissolved	20.4	20.0	20.4	20.9	20.4	20.6	20.5	20.2	19.9	20.2	20.2	20.4	20.5	20.4	21.6	20.3	20.2	20.3	20.1	19.8	20.8	20.4	20.8
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000077	0.0000058	<0.0000050	0.0000067	<0.0000050	0.0000067	0.0000078	0.0000066	0.0000063	0.0000057	0.0000068	0.0000090	0.0000063	0.0000079	0.0000204	0.0000079	0.0000061	0.0000086	0.0000074	0.0000132	0.0000099	0.0000073	0.0000097
Copper (Cu)-Dissolved	0.00023	0.00021	0.00028	0.00022	0.00022	0.00020	0.00025	0.00021	0.00024	0.00025	0.00023	0.00023	0.00025	0.00026	0.00090	0.00027	0.00022	0.00025	0.00023	0.00039	0.00038	0.00029	0.00030
Iron (Fe)-Dissolved	0.0020	0.0019	0.0019	0.0021	0.0017	0.0017	0.0016	0.0018	0.0018	0.0021	0.0017	0.0020	0.0017	0.0022	0.0024	0.0022	0.0022	0.0021	0.0022	0.0022	0.0024	0.0020	0.0021
Lead (Pb)-Dissolved	0.0000366	0.0000338	0.0000261	0.0000123	0.0000099	0.0000086	0.0000096	0.0000097	0.0000366	0.0000223	0.0000113	0.0000120	0.0000102	0.0000144	0.00118	0.0000111	0.0000127	0.0000131	0.0000077	0.000184	0.0000796	0.0000309	0.0000356
Lithium (Li)-Dissolved	0.00085	0.00082	0.00121	0.00127	0.00118	0.00120	0.00126	0.00121	0.00126	0.00113	0.00124	0.00127	0.00127	0.00128	0.00135	0.00128	0.00137	0.00134	0.00136	0.00067	0.00131	0.00155	0.00134
Magnesium (Mg)-Dissolved	4.87	4.81	4.90	4.94	4.88	4.94	4.93	4.87	4.77	4.85	4.86	4.90	4.92	4.90	4.85	4.86	4.82	4.87	4.83	4.40	4.91	4.85	4.94
Manganese (Mn)-Dissolved	0.00122	0.00116	0.000721	0.000676	0.000625	0.000715	0.000646	0.000669	0.000887	0.000592	0.000643	0.000617	0.000619	0.000712	0.00397	0.000934	0.000935	0.00108	0.00111	0.00211	0.00143	0.00105	0.00123
Mercury (Hg)-Dissolved	<0.00050	<0.030	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.0030	<0.00050	<0.0030	<0.00050	<0.0010	<0.00050	<0.0020	<0.0010	<0.00050	<0.00050	<0.00050	<0.0020	<0.00050	<0.00050	<0.00050	<0.0010
Molybdenum (Mo)-Dissolved	0.000547	0.000522	0.000501	0.000530	0.000485	0.000498	0.000503	0.000504	0.000506	0.000506	0.000510	0.000504	0.000519	0.000490	0.000944	0.000504	0.000503	0.000503	0.000506	0.000638	0.000541	0.000526	0.000527
Nickel (Ni)-Dissolved	0.000333	0.000310	0.000291	0.000309	0.000281	0.000299	0.000283	0.000305	0.000287	0.000294	0.000277	0.000307	0.000280	0.000286	0.000304	0.000304	0.000290	0.000280	0.000297	0.000274	0.000293	0.000280	0.000292
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.625	0.604	0.638	0.643	0.625	0.654	0.643	0.631	0.618	0.632	0.625	0.636	0.621	0.639	0.768	0.630	0.620	0.629	0.623	0.773	0.644	0.617	0.649
Selenium (Se)-Dissolved	0.000272	0.000279	0.000215	0.000235	0.000224	0.000229	0.000230	0.000230	0.000235	0.000243	0.000231	0.000233	0.000234	0.000224	0.00300	0.000198	0.000238	0.000210	0.000227	0.000147	0.000515	0.000334	0.000386
Silicon (Si)-Dissolved	1.95	1.90	2.03	2.07	2.04	2.06	2.06	2.02	2.06	2.03	2.02	2.03	2.03	2.04	2.09	2.08	2.07	2.07	2.05	3.40	2.10	2.04	2.07
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.61	1.65	1.59	1.61	1.65	1.69	1.62	1.69	1.68	1.56	1.63	1.65	1.65	1.64	4.78	1.62	1.61	1.58	1.59	1.74	2.16	1.89	1.89
Strontium (Sr)-Dissolved	0.114	0.110	0.112	0.117	0.110	0.111	0.110	0.109	0.109	0.111	0.110	0.113	0.113	0.112	0.112	0.111	0.110	0.108	0.110	0.123	0.112	0.112	0.111
Thallium (Tl)-Dissolved	0.0000087	0.0000085	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.000231	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000028	0.0000275	0.0000113	0.0000153
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000493	0.000499	0.000500	0.000491	0.000490	0.000501	0.000486	0.000503	0.000485	0.000497	0.000500	0.000496	0.000492	0.000497	0.000497	0.000496	0.000491	0.000491	0.000496	0.000444	0.000510	0.000500	0.000479
Vanadium (V)-Dissolved	0.000084	0.000078	0.000118	0.000101	0.000088	0.000084	0.000079	0.000074	0.000084	0.000107	0.000093	0.000099	0.000086	0.000100	0.000110	0.000104	0.000086	0.000093	0.000100	0.000163	0.000098	0.000096	0.000108
Zinc (Zn)-Dissolved	0.00153	0.00176	0.00168	0.00188	0.00112	0.00105	0.00057	0.00099	0.00289	0.00105	0.00087	0.00113	0.00092	0.00108	0.0126	0.00132	0.00112	0.00092	0.00110	0.00232	0.00316	0.00170	0.00166
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	OLD BRIDGE L 1M ABOVE BED	OLD BRIDGE L 1M DEEP	OLD BRIDGE L SH	WANETA R SH	WANETA R 1M DEEP	WANETA R 1M ABOVE BED	WANETA L 1M ABOVE BED	WANETA L 1M DEEP
Site	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**	**wa**
Sample	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**
TTS_Dist_CII	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**	**15800**
Date Sampled	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13	14-MAR-13
Time Sampled	17:28	17:42	17:54	15:03	15:16	15:28	15:40	15:52
ALS Sample ID	L1280396-27	L1280396-28	L1280396-29	L1280396-30	L1280396-31	L1280396-32	L1280396-33	L1280396-34
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	148	148	149	148	148	148	149	149
Hardness (as CaCO3)	72.3	72.3	72.9	71.4	71.2	71.2	71.4	71.6
pH	8.06	8.05	8.06	8.07	8.06	8.05	8.04	8.05
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	86	79	84	82	84	81	88	90
Turbidity	0.62	0.55	0.45	0.59	0.47	0.62	0.58	0.48
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	66.5	65.3	64.1	63.0	63.6	62.2	64.1	63.6
Ammonia, Total (as N)	<0.0050	0.0054	0.0225	0.0091	0.0092	0.0091	0.0095	0.0095
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.90	0.90	0.96	0.91	0.91	0.91	0.91	0.91
Fluoride (F)	0.067	0.067	0.068	0.070	0.070	0.070	0.070	0.070
Nitrate (as N)	0.146	0.147	0.156	0.149	0.150	0.149	0.149	0.149
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.063	0.068	0.086	0.076	0.073	0.068	0.067	0.077
Phosphorus (P)-Total Dissolved	0.0032	0.0045	0.0022	0.0042	0.0023	0.0022	0.0027	<0.0020
Phosphorus (P)-Total	0.0057	0.0060	0.0034	0.0067	0.0058	0.0058	0.0070	0.0066
Sulfate (SO4)	12.0	12.0	12.7	12.4	12.3	12.4	12.4	12.4
	0.90	0.87	0.94	0.94	1.08	0.82	0.86	0.88
Total Metals								
Mercury (Hg)-Total	<0.00050	<0.0030	<0.0080	<0.0010	<0.0010	<0.0010	<0.0020	<0.00050
Total Metals (Undigested)								
Aluminum (Al)-Total	0.00871	0.00876	0.00960	0.0111	0.0139	0.00976	0.00955	0.00941
Antimony (Sb)-Total	0.000039	0.000033	0.000061	0.000105	0.000118	0.000115	0.000118	0.000122
Arsenic (As)-Total	0.000234	0.000243	0.000246	0.000269	0.000288	0.000258	0.000286	0.000280
Barium (Ba)-Total	0.0211	0.0208	0.0212	0.0210	0.0213	0.0208	0.0206	0.0215
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000059	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000097	0.0000109	0.0000198	0.0000301	0.0000356	0.0000301	0.0000316	0.0000289
Calcium (Ca)-Total	21.0	20.8	20.8	21.5	20.3	20.5	20.7	20.5
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000084	0.0000113	0.0000117	0.0000142	0.0000172	0.0000121	0.0000148	0.0000098
Copper (Cu)-Total	0.00027	0.00029	0.00031	0.00039	0.00042	0.00038	0.00037	0.00038
Iron (Fe)-Total	0.0076	0.0074	0.0077	0.0101	0.0136	0.0100	0.0089	0.0087
Lead (Pb)-Total	0.0000478	0.000175	0.000237	0.000224	0.000214	0.000191	0.000224	0.000147
Lithium (Li)-Total	0.00137	0.00136	0.00139	0.00140	0.00086	0.00138	0.00128	0.00139
Magnesium (Mg)-Total	5.00	4.95	4.97	4.98	4.83	4.84	4.91	4.85
Manganese (Mn)-Total	0.00162	0.00181	0.00268	0.00195	0.00182	0.00178	0.00176	0.00171
Molybdenum (Mo)-Total	0.000506	0.000500	0.000516	0.000523	0.000534	0.000516	0.000538	0.000525
Nickel (Ni)-Total	0.000319	0.000296	0.000329	0.000323	0.000306	0.000313	0.000294	0.000281
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.642	0.646	0.675	0.643	0.618	0.623	0.621	0.631
Selenium (Se)-Total	0.000209	0.000237	0.000223	0.000287	0.000278	0.000285	0.000275	0.000275
Silicon (Si)-Total	2.11	2.09	2.15	2.14	2.06	2.09	2.08	2.08
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.62	1.69	1.72	1.69	1.69	1.68	1.70	1.69
Strontium (Sr)-Total	0.109	0.113	0.112	0.110	0.116	0.110	0.111	0.112
Thallium (Tl)-Total	<0.0000020	<0.0000020	<0.0000020	0.0000088	0.0000090	0.0000086	0.0000090	0.0000093
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000496	0.000497	0.000526	0.000505	0.000497	0.000513	0.000494	0.000518
Vanadium (V)-Total	0.000109	0.000105	0.000133	0.000112	0.000078	0.000122	0.000115	0.000106
Zinc (Zn)-Total	0.00119	0.00107	0.00280	0.00195	0.00162	0.00172	0.00204	0.00162
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00471	0.00474	0.00462	0.00482	0.00473	0.00468	0.00476	0.00515
Antimony (Sb)-Dissolved	0.000034	0.000039	0.000053	0.000106	0.000103	0.000112	0.000108	0.000112
Arsenic (As)-Dissolved	0.000223	0.000246	0.000247	0.000280	0.000254	0.000248	0.000270	0.000250
Barium (Ba)-Dissolved	0.0200	0.0204	0.0211	0.0204	0.0205	0.0207	0.0210	0.0209
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000078	0.0000074	0.0000203	0.0000305	0.0000274	0.0000250	0.0000234	0.0000264
Calcium (Ca)-Dissolved	20.8	20.8	20.9	20.5	20.5	20.5	20.5	20.6
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000077	0.0000058	0.0000090	0.0000071	0.0000077	0.0000089	0.0000072	0.0000065
Copper (Cu)-Dissolved	0.00025	0.00023	0.00024	0.00028	0.00029	0.00029	0.00031	0.00030
Iron (Fe)-Dissolved	0.0019	0.0020	0.0019	0.0021	0.0020	0.0022	0.0021	0.0020
Lead (Pb)-Dissolved	0.0000103	0.0000100	0.0000616	0.0000591	0.0000513	0.0000479	0.0000454	0.0000457
Lithium (Li)-Dissolved	0.00137	0.00136	0.00135	0.00140	0.00143	0.00136	0.00130	0.00141
Magnesium (Mg)-Dissolved	4.96	4.96	5.01	4.87	4.84	4.84	4.88	4.89
Manganese (Mn)-Dissolved	0.000914	0.000942	0.00196	0.00105	0.00106	0.00106	0.00107	0.000963
Mercury (Hg)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.012
Molybdenum (Mo)-Dissolved	0.000506	0.000511	0.000505	0.000513	0.000517	0.000513	0.000519	0.000521
Nickel (Ni)-Dissolved	0.000289	0.000297	0.000297	0.000271	0.000273	0.000283	0.000279	0.000282
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.628	0.643	0.660	0.628	0.624	0.648	0.631	0.646
Selenium (Se)-Dissolved	0.000212	0.000218	0.000217	0.000297	0.000298	0.000295	0.000292	0.000278
Silicon (Si)-Dissolved	2.08	2.07	2.13	2.07	2.07	2.07	2.07	2.06
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.65	1.64	1.75	1.69	1.72	1.70	1.75	1.73
Strontium (Sr)-Dissolved	0.109	0.109	0.111	0.112	0.111	0.108	0.111	0.112
Thallium (Tl)-Dissolved	<0.0000020	<0.0000020	<0.0000020	0.0000085	0.0000083	0.0000087	0.0000091	0.0000082
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000497	0.000503	0.000522	0.000510	0.000519	0.000504	0.000518	0.000505
Vanadium (V)-Dissolved	0.000114	0.000093	0.000088	0.000087	0.000095	0.000103	0.000107	0.000109
Zinc (Zn)-Dissolved	0.00140	0.00106	0.00174	0.00175	0.00161	0.00175	0.00136	0.00194
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	WANETA L SH	BIRCHBANK R SH	BIRCHBANK R 1M DEEP	BIRCHBANK R 1M ABOVE BED	BIRCHBANK L 1M ABOVE BED	BIRCHBANK L 1M DEEP	BIRCHBANK L SH	STONEY CK R SH
Site	**wa**	**bb**	**bb**	**bb**	**bb**	**bb**	**bb**	**sc**
Sample	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**
TTS_Dist_CII	**15800**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-9720**	**-1975**
Date Sampled	14-MAR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13
Time Sampled	16:02	13:00	13:16	13:27	13:41	13:54	14:05	14:28
ALS Sample ID	L1280396-35	L1291154-1	L1291154-2	L1291154-3	L1291154-4	L1291154-5	L1291154-6	L1291154-7
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	145	142	142	138	140	141	142	141
Hardness (as CaCO3)	71.1	69.1	68.9	68.8	68.3	68.3	68.7	68.3
pH	7.83	8.22	8.10	7.93	8.06	8.07	8.09	8.07
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	83	88	89	86	86	89	86	85
Turbidity	0.42	0.53	0.52	0.44	0.45	0.50	0.44	0.47
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	60.5	59.9	58.5	57.1	56.1	61.9	57.8	59.2
Ammonia, Total (as N)	0.0092	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0106
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.91	0.88	0.89	0.88	0.88	0.87	0.87	0.91
Fluoride (F)	0.070	0.072	0.073	0.072	0.072	0.072	0.073	0.073
Nitrate (as N)	0.148	0.145	0.146	0.144	0.143	0.145	0.144	0.143
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.073	0.068	0.068	0.076	<0.050	0.067	0.063	0.075
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0066	0.0044	0.0036	0.0034	0.0035	0.0035	0.0032	0.0034
Sulfate (SO4)	12.4	11.3	11.3	11.3	11.3	11.2	11.3	11.4
	0.88	4.72	1.74	1.65	1.43	1.31	1.41	1.91
Total Metals								
Mercury (Hg)-Total	<0.0010	<0.00050	<0.00050	<0.00050	<0.00056	<0.00050	<0.00050	<0.00066
Total Metals (Undigested)								
Aluminum (Al)-Total	0.00854	0.0114	0.0144	0.0135	0.0129	0.0124	0.0123	0.0113
Antimony (Sb)-Total	0.000111	0.000049	0.000056	0.000049	0.000040	0.000049	0.000066	0.000043
Arsenic (As)-Total	0.000266	0.000232	0.000233	0.000222	0.000244	0.000278	0.000466	0.000218
Barium (Ba)-Total	0.0211	0.0207	0.0205	0.0205	0.0206	0.0208	0.0206	0.0204
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000311	0.0000122	0.0000131	0.0000110	0.0000125	0.0000173	0.0000264	0.0000114
Calcium (Ca)-Total	20.6	20.6	24.5	20.2	20.1	25.3	19.6	22.2
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000093	0.0000091	0.0000117	0.0000134	0.0000104	0.0000122	0.0000122	0.0000105
Copper (Cu)-Total	0.00036	0.00035	0.00066	0.00032	0.00035	0.00039	0.00057	0.00030
Iron (Fe)-Total	0.0085	0.0100	0.0177	0.0117	0.0105	0.0191	0.0140	0.0091
Lead (Pb)-Total	0.000139	0.0000573	0.0000760	0.0000529	0.0000629	0.0000734	0.000115	0.0000369
Lithium (Li)-Total	0.00137	0.00098	0.00101	0.00092	0.00096	0.00094	0.00092	0.00091
Magnesium (Mg)-Total	4.88	4.85	4.75	4.83	4.79	4.72	4.64	4.67
Manganese (Mn)-Total	0.00177	0.00195	0.00235	0.00195	0.00189	0.00230	0.00206	0.00175
Molybdenum (Mo)-Total	0.000506	0.000530	0.000558	0.000548	0.000555	0.0116	0.000579	0.000518
Nickel (Ni)-Total	0.000296	0.000281	0.000317	0.000289	0.000293	0.000301	0.000307	0.000280
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.646	0.668	0.667	0.662	0.668	0.662	0.649	0.659
Selenium (Se)-Total	0.000288	0.000248	0.000216	0.000234	0.000227	0.000234	0.000251	0.000239
Silicon (Si)-Total	2.07	2.16	2.11	2.15	2.13	2.10	2.09	2.17
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.74	1.65	1.70	1.64	1.63	1.69	1.70	1.60
Strontium (Sr)-Total	0.110	0.112	0.117	0.111	0.113	0.116	0.112	0.112
Thallium (Tl)-Total	0.0000087	0.0000024	0.0000027	0.0000034	0.0000027	0.0000027	0.0000033	<0.0000020
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	<0.00050	<0.00050	0.00094	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000512	0.000505	0.000518	0.000506	0.000519	0.000508	0.000511	0.000505
Vanadium (V)-Total	0.000091	0.000130	0.000131	0.000096	0.000139	0.000256	0.000144	0.000145
Zinc (Zn)-Total	0.00141	0.00311	0.00222	0.00171	0.00161	0.00186	0.00293	0.00119
Zirconium (Zr)-Total	<0.00010	<0.00010	0.00055	<0.00010	<0.00010	0.00107	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00520	0.00558	0.00588	0.00580	0.00621	0.00636	0.00546	0.00753
Antimony (Sb)-Dissolved	0.000121	0.000046	0.000044	0.000044	0.000046	0.000045	0.000037	0.000062
Arsenic (As)-Dissolved	0.000262	0.000220	0.000220	0.000232	0.000230	0.000231	0.000217	0.000529
Barium (Ba)-Dissolved	0.0211	0.0200	0.0200	0.0201	0.0206	0.0203	0.0202	0.0202
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000259	0.0000094	0.0000100	0.0000090	0.0000087	0.0000101	0.0000089	0.0000211
Calcium (Ca)-Dissolved	20.4	19.9	19.9	19.8	19.6	19.7	19.8	19.7
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000066	0.0000053	0.0000080	0.0000071	<0.0000050	0.0000066	0.0000072	0.0000085
Copper (Cu)-Dissolved	0.00031	0.00027	0.00027	0.00025	0.00025	0.00024	0.00025	0.00047
Iron (Fe)-Dissolved	0.0020	0.0114	0.0031	0.0031	0.0025	0.0024	0.0027	0.0034
Lead (Pb)-Dissolved	0.0000423	0.0000216	0.0000316	0.0000146	0.0000082	0.0000064	<0.0000050	0.0000468
Lithium (Li)-Dissolved	0.00135	0.00090	0.00097	0.00090	0.00099	0.00098	0.00095	0.00091
Magnesium (Mg)-Dissolved	4.87	4.70	4.68	4.71	4.69	4.66	4.69	4.63
Manganese (Mn)-Dissolved	0.00102	0.00101	0.000924	0.000939	0.000953	0.000914	0.000929	0.00130
Mercury (Hg)-Dissolved	<0.00050	<0.0014	<0.00050	<0.00050	<0.00050	<0.00060	<0.00050	<0.00050
Molybdenum (Mo)-Dissolved	0.000511	0.000563	0.000543	0.000555	0.000564	0.000565	0.000547	0.000554
Nickel (Ni)-Dissolved	0.000289	0.000289	0.000293	0.000284	0.000283	0.000279	0.000266	0.000287
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.633	0.651	0.664	0.649	0.659	0.652	0.647	0.656
Selenium (Se)-Dissolved	0.000292	0.000213	0.000220	0.000237	0.000233	0.000214	0.000218	0.000225
Silicon (Si)-Dissolved	2.04	2.09	2.08	2.08	2.07	2.08	2.08	2.15
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.76	1.62	1.62	1.63	1.63	1.62	1.61	1.69
Strontium (Sr)-Dissolved	0.112	0.110	0.110	0.111	0.112	0.112	0.113	0.113
Thallium (Tl)-Dissolved	0.0000080	0.0000023	0.0000063	0.0000024	0.0000023	0.0000022	<0.0000020	0.0000024
Tin (Sn)-Dissolved	<0.000010	0.000038	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000504	0.000516	0.000514	0.000507	0.000509	0.000506	0.000517	0.000502
Vanadium (V)-Dissolved	0.000091	0.000111	0.000113	0.000124	0.000121	0.000121	0.000139	0.000139
Zinc (Zn)-Dissolved	0.00744	0.00356	0.00229	0.00177	0.00137	0.00146	0.00172	0.00306
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	6.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	STONEY CK R 1M DEEP	STONEY CK R 1M ABOVE BED	STONEY CK L 1M ABOVE BED	STONEY CK L 1M DEEP	STONEY CK L SH	NEW BRIDGE R SH	NEW BRIDGE R 1M DEEP
Site	**sc**	**sc**	**sc**	**sc**	**sc**	**nb**	**nb**
Sample	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**
TTS_Dist_CII	**-1975**	**-1975**	**-1975**	**-1975**	**-1975**	**230**	**230**
Date Sampled	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13	15-APR-13
Time Sampled	14:40	14:55	15:06	15:19	15:31	15:46	16:10
ALS Sample ID	L1291154-8	L1291154-9	L1291154-10	L1291154-11	L1291154-12	L1291154-13	L1291154-14
Matrix	Water	Water	Water	Water	Water	Water	Water
Physical Tests							
Conductivity	142	141	141	141	142	168	141
Hardness (as CaCO3)	68.8	68.8	69.3	69.5	73.7	73.7	67.5
pH	8.08	8.10	8.09	8.11	8.10	8.09	8.10
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	87	87	85	84	70	92	81
Turbidity	0.45	0.45	0.40	0.42	0.51	0.44	0.47
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	57.6	58.5	58.2	58.1	57.5	59.6	59.5
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0530	<0.0050
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.89	0.89	0.88	0.88	0.92	1.41	0.87
Fluoride (F)	0.072	0.073	0.072	0.073	0.072	0.172	0.073
Nitrate (as N)	0.144	0.144	0.144	0.144	0.147	0.166	0.144
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.060	0.068	0.081	0.068	0.059	0.118	0.060
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0037	0.0037	0.0040	0.0037	0.0033	0.0037	0.0034
Sulfate (SO4)	11.3	11.3	11.3	11.3	11.3	22.5	11.3
	1.57	1.66	1.68	1.36	1.58	2.04	1.52
Total Metals							
Mercury (Hg)-Total	<0.00050	<0.00095	<0.027	<0.00050	<0.00050	<0.0025	<0.0017
Total Metals (Undigested)							
Aluminum (Al)-Total	0.0116	0.0127	0.0121	0.0135	0.0108	0.0167	0.0123
Antimony (Sb)-Total	0.000046	0.000048	0.000044	0.000040	0.000041	0.000714	0.000043
Arsenic (As)-Total	0.000231	0.000242	0.000237	0.000244	0.000229	0.000676	0.000250
Barium (Ba)-Total	0.0204	0.0206	0.0203	0.0206	0.0208	0.0210	0.0205
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000122	0.0000129	0.0000121	0.0000105	0.0000111	0.000862	0.0000166
Calcium (Ca)-Total	19.9	20.0	20.2	20.1	20.3	21.8	20.1
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000115	0.0000144	0.0000139	0.0000124	0.0000136	0.0000247	0.0000113
Copper (Cu)-Total	0.00030	0.00037	0.00032	0.00029	0.00029	0.00107	0.00031
Iron (Fe)-Total	0.0116	0.0101	0.0109	0.0097	0.0104	0.0113	0.0098
Lead (Pb)-Total	0.0000483	0.0000625	0.0000537	0.0000373	0.0000416	0.000878	0.0000394
Lithium (Li)-Total	0.00091	0.00098	0.00094	0.00095	0.00088	0.00098	0.00083
Magnesium (Mg)-Total	4.63	4.64	4.68	4.70	4.69	4.68	4.72
Manganese (Mn)-Total	0.00182	0.00187	0.00194	0.00177	0.00186	0.00429	0.00184
Molybdenum (Mo)-Total	0.000524	0.000560	0.000540	0.000546	0.000530	0.00124	0.000552
Nickel (Ni)-Total	0.000306	0.000313	0.000319	0.000277	0.000288	0.000323	0.000303
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.666	0.648	0.655	0.650	0.658	0.819	0.651
Selenium (Se)-Total	0.000204	0.000243	0.000233	0.000216	0.000222	0.00322	0.000215
Silicon (Si)-Total	2.11	2.13	2.14	2.12	2.12	2.15	2.14
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.61	1.68	1.62	1.62	1.63	4.97	1.60
Strontium (Sr)-Total	0.110	0.111	0.107	0.111	0.110	0.112	0.109
Thallium (Tl)-Total	0.0000024	0.0000022	0.0000021	0.0000022	0.0000030	0.000711	0.0000039
Tin (Sn)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	0.00055	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000511	0.000499	0.000516	0.000510	0.000514	0.000518	0.000508
Vanadium (V)-Total	0.000144	0.000142	0.000142	0.000126	0.000140	0.000123	0.000147
Zinc (Zn)-Total	0.00144	0.00219	0.00187	0.00117	0.00111	0.0105	0.00191
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00539	0.00597	0.00561	0.00598	0.00604	0.00665	0.00532
Antimony (Sb)-Dissolved	0.000044	0.000043	0.000037	0.000040	0.000044	0.000701	0.000039
Arsenic (As)-Dissolved	0.000238	0.000222	0.000235	0.000233	0.000213	0.000625	0.000224
Barium (Ba)-Dissolved	0.0201	0.0205	0.0206	0.0204	0.0211	0.0209	0.0203
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000107	0.0000114	0.0000096	0.0000117	0.0000083	0.000842	0.0000148
Calcium (Ca)-Dissolved	19.9	19.9	20.0	20.1	21.6	21.8	19.4
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000071	0.0000065	0.0000069	0.0000102	0.0000063	0.0000182	0.0000093
Copper (Cu)-Dissolved	0.00025	0.00026	0.00025	0.00026	0.00029	0.00093	0.00026
Iron (Fe)-Dissolved	0.0023	0.0026	0.0023	0.0026	0.0042	0.0024	0.0023
Lead (Pb)-Dissolved	<0.0000050	0.0000163	<0.0000050	0.0000156	0.0000088	0.000458	<0.0000050
Lithium (Li)-Dissolved	0.00097	0.00094	0.00083	0.00088	0.00090	0.00100	0.00077
Magnesium (Mg)-Dissolved	4.64	4.65	4.70	4.69	4.78	4.70	4.61
Manganese (Mn)-Dissolved	0.000883	0.000857	0.000886	0.000933	0.00109	0.00342	0.00102
Mercury (Hg)-Dissolved	<0.00090	<0.014	<0.0036	<0.0021	<0.00050	<0.00056	<0.00050
Molybdenum (Mo)-Dissolved	0.000539	0.000547	0.000529	0.000537	0.000857	0.00127	0.000547
Nickel (Ni)-Dissolved	0.000289	0.000282	0.000273	0.000278	0.000272	0.000310	0.000261
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.658	0.657	0.657	0.648	0.659	0.806	0.643
Selenium (Se)-Dissolved	0.000216	0.000237	0.000213	0.000225	0.000247	0.00324	0.000226
Silicon (Si)-Dissolved	2.11	2.11	2.12	2.11	2.14	2.14	2.07
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.63	1.61	1.62	1.61	1.67	4.88	1.56
Strontium (Sr)-Dissolved	0.111	0.110	0.111	0.109	0.114	0.112	0.108
Thallium (Tl)-Dissolved	0.0000025	0.0000021	0.0000025	<0.0000020	0.0000030	0.000702	0.0000039
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000500	0.000504	0.000503	0.000497	0.000533	0.000521	0.000511
Vanadium (V)-Dissolved	0.000121	0.000124	0.000142	0.000123	0.000131	0.000140	0.000131
Zinc (Zn)-Dissolved	0.00151	0.00176	0.00117	0.00131	0.00150	0.00975	0.00103
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	0.00012	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	NEW BRIDGE R 1M ABOVE BED	NEW BRIDGE L 1M ABOVE BED	NEW BRIDGE L 1M DEEP	NEW BRIDGE L SH	OLD BRIDGE R SH	OLD BRIDGE R 1M DEEP	OLD BRIDGE R 1M ABOVE BED	OLD BRIDGE L 1M ABOVE BED	OLD BRIDGE L 1M DEEP	OLD BRIDGE L SH	WANETA R SH	WANETA R 1M DEEP	WANETA R 1M ABOVE BED	WANETA L 1M ABOVE BED	WANETA L 1M DEEP	WANETA L SH	BIRCHBANK GRAB	STONEY CREEK GRAB	NEW BRIDGE GRAB	OLD BRIDGE GRAB	WANETA GRAB	BIRCHBANK GRAB	STONEY CREEK GRAB
Site	**nb**	**nb**	**nb**	**nb**	**ob**	**ob**	**ob**	**ob**	**ob**	**ob**	**wa**	**wa**	**wa**	**wa**	**wa**	**wa**	**bb**	**sc**	**nb**	**ob**	**wa**	**bb**	**sc**
Sample	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-1md**	**r-1mab**	**l-1mab**	**l-1md**	**l-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**230**	**230**	**230**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**1090**	**15800**	**15800**	**15800**	**15800**	**15800**	**15800**	**-9720**	**-1975**	**230**	**1090**	**15800**	**-9720**	**-1975**
Date Sampled	15-APR-13	15-APR-13	15-APR-13	15-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	16-APR-13	28-MAR-13	28-MAR-13	28-MAR-13	28-MAR-13	28-MAR-13	09-APR-13	09-APR-13
Time Sampled	16:31	16:45	16:59	17:10	11:59	12:11	12:28	12:39	12:52	13:04	09:22	09:44	09:58	10:13	10:28	10:42	11:10	12:05	14:16	13:50	13:05	00:00	00:00
ALS Sample ID	L1291154-15	L1291154-16	L1291154-17	L1291154-18	L1291154-25	L1291154-26	L1291154-27	L1291154-28	L1291154-29	L1291154-30	L1291154-19	L1291154-20	L1291154-21	L1291154-22	L1291154-23	L1291154-24	L1284870-1	L1284870-2	L1284870-3	L1284870-4	L1284870-5	L1288829-1	L1288829-2
Matrix	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests																							
Conductivity	142	142	142	144	145	144	144	143	142	144	143	143	143	139	142	143	143	143	164	146	142	139	137
Hardness (as CaCO3)	77.9	68.9	68.8	69.0	70.6	70.4	70.9	70.5	70.0	69.8	70.5	69.5	69.8	70.4	70.5	69.9	69.4	69.1	72.9	69.8	70.4	67.7	66.9
pH	8.11	8.11	8.12	8.11	8.09	8.10	8.09	8.11	8.11	8.13	8.10	8.11	8.09	7.95	8.06	8.06	8.06	8.05	8.05	8.06	7.88	8.05	8.03
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	73	84	77	78	72	86	84	81	78	74	79	81	79	77	67	64	84	84	98	84	84	84	82
Turbidity	0.44	0.57	0.46	0.43	0.39	0.44	0.48	0.39	0.45	0.41	0.58	0.50	0.43	0.40	0.43	0.36	0.42	0.37	0.53	0.42	0.63	0.80	1.08
Anions and Nutrients																							
Alkalinity, Total (as CaCO3)	58.4	57.8	58.7	60.8	60.3	56.3	61.8	58.5	56.7	62.0	60.4	55.9	57.1	59.5	61.0	57.9	61.2	66.5	62.3	68.4	65.9	55.0	53.6
Ammonia, Total (as N)	<0.0050	<0.0050	<0.0050	0.0200	0.0128	0.0082	0.0083	0.0061	<0.0050	0.0149	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0063	<0.0050	0.0158	0.0717	0.0208	0.0112	<0.0050	0.0090
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.87	0.87	0.87	0.94	0.96	0.93	0.93	0.90	0.90	0.96	0.94	0.93	0.94	0.93	0.93	0.94	0.80	0.84	1.46	0.91	0.82	0.86	0.90
Fluoride (F)	0.072	0.072	0.072	0.073	0.082	0.078	0.077	0.073	0.073	0.073	0.075	0.075	0.075	0.075	0.075	0.075	0.067	0.068	0.135	0.076	0.069	0.074	0.074
Nitrate (as N)	0.144	0.145	0.145	0.152	0.153	0.149	0.149	0.148	0.146	0.156	0.152	0.150	0.149	0.149	0.151	0.151	0.141	0.143	0.158	0.146	0.144	0.141	0.141
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.062	0.059	0.066	0.080	0.075	0.068	0.063	0.068	0.064	0.081	0.062	0.065	0.088	0.064	0.072	0.080	<0.050	0.066	0.091	0.052	0.050	<0.050	0.077
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0030	0.0025	<0.0020	0.0023	0.0029	<0.0020	<0.0020
Phosphorus (P)-Total	0.0035	0.0042	0.0038	0.0038	0.0033	0.0037	0.0034	0.0035	0.0033	0.0031	0.0038	0.0038	0.0039	0.0035	0.0034	0.0033	0.0045	0.0028	0.0033	0.0032	0.0032	0.0041	0.0071
Sulfate (SO4)	11.3	11.4	11.3	12.0	12.6	12.0	11.9	11.5	11.4	11.9	11.7	11.7	11.8	11.7	11.8	11.8	11.8	11.9	19.7	12.9	12.2	11.1	11.1
	1.62	1.60	1.40	1.72	1.41	1.78	1.51	0.93	1.66	1.56	1.50	1.61	1.60	1.67	1.47	1.44	1.31	1.17	1.10	1.21	1.22	1.47	1.40
Total Metals																							
Mercury (Hg)-Total	<0.00073	<0.00050	<0.00088	<0.0049	<0.00090	<0.00050	<0.00050	<0.00050	<0.0038	<0.00050	<0.0023	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0060	<0.0020	<0.0010	<0.00057	<0.0012
Total Metals (Undigested)																							
Aluminum (Al)-Total	0.0119	0.0167	0.0122	0.0128	0.0116	0.0121	0.0114	0.0115	0.0122	0.0114	0.0124	0.0120	0.0119	0.00522	0.0121	0.0118	0.00964	0.0106	0.0103	0.0100	0.0108	0.0225	0.0235
Antimony (Sb)-Total	0.000042	0.000056	0.000039	0.000069	0.000161	0.000102	0.000090	0.000043	0.000039	0.000056	0.000093	0.000085	0.000095	0.000098	0.000090	0.000090	0.000049	0.000071	0.00136	0.000215	0.000117	0.000043	0.000097
Arsenic (As)-Total	0.000235	0.000258	0.000218	0.000242	0.000326	0.000281	0.000279	0.000211	0.000236	0.000218	0.000256	0.000259	0.000252	0.000240	0.000246	0.000268	0.000201	0.000624	0.000847	0.000318	0.000242	0.000228	0.000522
Barium (Ba)-Total	0.0206	0.0211	0.0211	0.0211	0.0211	0.0203	0.0205	0.0208	0.0209	0.0208	0.0212	0.0208	0.0210	0.0212	0.0210	0.0209	0.0200	0.0201	0.0203	0.0205	0.0200	0.0205	0.0204
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	0.0000060	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0057	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.0000151	0.0000310	0.0000119	0.0000214	0.0000723	0.0000418	0.0000361	0.0000117	0.0000100	0.0000189	0.0000288	0.0000302	0.0000303	0.0000272	0.0000284	0.0000296	0.0000081	0.0000338	0.000947	0.0000706	0.0000481	0.0000159	0.0000357
Calcium (Ca)-Total	20.0	19.8	19.9	19.9	20.8	20.5	20.3	20.2	20.1	20.3	20.1	20.1	20.2	20.4	20.4	20.3	19.8	20.1	21.5	20.3	19.9	19.5	19.0
Chromium (Cr)-Total	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00096	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000109	0.000120	0.0000078	0.0000130	0.0000113	0.0000096	0.0000122	0.0000098	0.0000118	0.0000136	0.0000095	0.0000108	0.0000131	0.0000083	0.0000135	0.0000138	0.0000112	0.0000098	0.0000279	0.0000114	0.000117	0.0000158	0.0000176
Copper (Cu)-Total	0.00031	0.00106	0.00030	0.00106	0.00046	0.00036	0.00035	0.00031	0.00030	0.00032	0.00042	0.00039	0.00037	0.00028	0.00037	0.00039	0.00030	0.00029	0.00076	0.00039	0.00054	0.00041	0.00040
Iron (Fe)-Total	0.0091	0.0160	0.0097	0.0124	0.0098	0.0079	0.0087	0.0094	0.0096	0.0114	0.0091	0.0107	0.0115	0.0023	0.0095	0.0110	0.0084	0.0064	0.0067	0.0064	0.0173	0.0187	0.0219
Lead (Pb)-Total	0.0000430	0.000168	0.0000429	0.000272	0.000152	0.000170	0.000116	0.0000400	0.0000337	0.000104	0.0000752	0.0000685	0.0000744	0.0000108	0.0000678	0.000106	0.0000553	0.0000583	0.00186	0.000116	0.000134	0.0000675	0.000174
Lithium (Li)-Total	0.00082	0.00088	0.00089	0.00083	0.00081	0.00081	0.00081	0.00082	0.00081	0.00075	0.00086	0.00085	0.00078	0.00084	0.00079	0.00082	0.00065	0.00072	0.00087	0.00075	0.00099	0.00086	0.00085
Magnesium (Mg)-Total	4.74	4.71	4.71	4.67	4.80	4.76	4.76	4.82	4.83	4.81	4.68	4.71	4.72	4.74	4.73	4.77	4.76	4.79	4.86	4.79	4.74	4.60	4.45
Manganese (Mn)-Total	0.00205	0.00262	0.00216	0.00301	0.00254	0.00204	0.00201	0.00217	0.00203	0.00272	0.00204	0.00220	0.00208	0.00122	0.00208	0.00218	0.00165	0.00157	0.00387	0.00212	0.00187	0.00236	0.00229
Molybdenum (Mo)-Total	0.000515	0.000545	0.000538	0.000530	0.000570	0.000556	0.000554	0.000555	0.000539	0.000540	0.000569	0.000567	0.000552	0.000555	0.000550	0.000545	0.000484	0.000522	0.00118	0.000558	0.00139	0.000527	0.000526
Nickel (Ni)-Total	0.000260	0.000806	0.000297	0.000346	0.000321	0.000270	0.000282	0.000362	0.000283	0.000282	0.000299	0.000312	0.000274	0.000270	0.000310	0.000308	0.000340	0.000323	0.000346	0.000349	0.000345	0.000327	0.000310
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.665	0.670	0.666	0.672	0.673	0.664	0.675	0.665	0.677	0.664	0.663	0.671	0.664	0.663	0.653	0.660	0.591	0.600	0.745	0.612	0.567	0.680	0.684
Selenium (Se)-Total	0.000215	0.000239	0.000229	0.000206	0.000446	0.000304	0.000317	0.000232	0.000239	0.000230	0.000272	0.000280	0.000282	0.000278	0.000262	0.000260	0.000192	0.000207	0.00228	0.000395	0.000225	0.000216	0.000201
Silicon (Si)-Total	2.14	2.12	2.13	2.19	2.20	2.16	2.15	2.13	2.13	2.16	2.17	2.16	2.16	2.16	2.16	2.18	1.96	2.04	2.02	2.02	1.99	2.35	2.46
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	1.57	1.65	1.61	1.68	1.92	1.75	1.74	1.65	1.66	1.67	1.73	1.74	1.72	1.77	1.75	1.76	1.49	1.48	4.63	1.85	1.57	1.61	1.65
Strontium (Sr)-Total	0.108	0.113	0.111	0.115	0.112	0.110	0.110	0.113	0.111	0.110	0.114	0.112	0.113	0.112	0.112	0.113	0.109	0.109	0.112	0.111	0.111	0.108	0.104
Thallium (Tl)-Total	0.0000026	0.0000034	0.0000026	0.0000029	0.0000739	0.0000384	0.0000324	0.0000021	0.0000021	0.0000029	0.0000230	0.0000229	0.0000241	0.0000226	0.0000219	0.0000225	<0.0000020	0.0000036	0.00106	0.000134	0.0000395	<0.0000020	<0.0000020
Tin (Sn)-Total	<0.000010	0.000075	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000082	0.000016
Titanium (Ti)-Total	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00076	0.00088
Uranium (U)-Total	0.000514	0.000516	0.000512	0.000536	0.000532	0.000499	0.000516	0.000517	0.000521	0.000529	0.000519	0.000515	0.000526	0.000526	0.000517	0.000518	0.000474	0.000481	0.000499	0.000493	0.000473	0.000524	0.000509
Vanadium (V)-Total	0.000131	0.000156	0.000142	0.000164	0.000160	0.000136	0.000129	0.000141	0.000132	0.000128	0.000156	0.000145	0.000131	0.000125	0.000141	0.000163	0.000111	0.000116	0.000106	0.000110	0.000273	0.000091	0.000119
Zinc (Zn)-Total	0.00136	0.00587	0.00140	0.00222	0.00303	0.00220	0.00197	0.00114	0.00141	0.00139	0.00254	0.00212	0.00178	0.00183	0.00169	0.00186	0.00070	0.00221	0.0118	0.00210	0.00170	0.00278	0.00332
Zirconium (Zr)-Total	<0.00010	0.00017	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals																							
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00383	0.00540	0.00565	0.00600	0.00637	0.00562	0.00523	0.00549	0.00571	0.00566	0.00532	0.00491	0.00556	0.0107	0.00533	0.00537	0.00651	0.00619	0.00640	0.00482	0.00431	0.00718	0.00737
Antimony (Sb)-Dissolved	0.000044	0.000046	0.000042	0.000073	0.000161	0.000099	0.000081	0.000040	0.000043	0.000060	0.000091	0.000090	0.000087	0.000088	0.000089	0.000092	0.000041	0.000065	0.00134	0.000214	0.000105	0.000045	0.000075
Arsenic (As)-Dissolved	0.000240	0.000228	0.000223	0.000249	0.000308	0.000280	0.000258	0.000220	0.000237	0.000227	0.000259	0.000237	0.000262	0.000269	0.000269	0.000267	0.000212	0.000593	0.000788	0.000286	0.000237	0.000220	0.000466
Barium (Ba)-Dissolved	0.0201	0.0200	0.0204	0.0208	0.0206	0.0204	0.0206	0.0205	0.0203	0.0206	0.0209	0.0206	0.0205	0.0208	0.0206	0.0206	0.0199	0.0204	0.0203	0.0197	0.0202	0.0201	0.0196
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.0000083	0.0000103	0.0000104	0.0000180	0.0000720	0.0000453	0.0000366	0.0000097	0.0000105	0.0000135	0.0000268	0.0000290	0.0000251	0.0000310	0.0000251	0.0000279	0.0000064	0.0000331	0.000910	0.0000672	0.0000202	0.0000109	0.0000341
Calcium (Ca)-Dissolved	22.5	19.9	19.8	19.9	20.4	20.3	20.4	20.3	20.1	20.1	20.4	20.1	20.2	20.4	20.4	20.2	20.0	19.8	21.3	20.1	20.2	19.5	19.4
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000053	<0.0000050	0.0000065	0.0000073	0.0000068	0.0000100	0.0000071	<0.0000050	0.0000072	0.0000096	0.0000092	0.0000085	0.0000086	0.0000104	0.0000091	0.0000078	0.0000055	0.0000063	0.0000234	0.0000073	0.0000051	0.0000075	0.0000082
Copper (Cu)-Dissolved	0.00024	0.00026	0.00025	0.00173	0.00037	0.00027	0.00026	0.00024	0.00025	0.00026	0.00028	0.00029	0.00031	0.00040	0.00031	0.00030	0.00031	0.00028	0.00070	0.00032	0.00033	0.00037	0.00031
Iron (Fe)-Dissolved	0.0015	0.0023	0.0022	0.0039	0.0028	0.0023	0.0025	0.0023	0.0023	0.0022	0.0025	0.0025	0.0025	0.0090	0.0030	0.0023	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	0.0041	0.0040
Lead (Pb)-Dissolved	<0.0000050	<0.0000050	<0.0000050	0.000197	0.0000480	0.0000336	0.0000248	0.0000070	<0.0000050	0.0000265	0.0000416	0.0000141	0.0000147	0.0000706	0.0000095	0.0000302	0.0000148	0.0000176	0.000668	0.0000404	0.0000188	0.0000365	0.0000553
Lithium (Li)-Dissolved	0.00094	0.00083	0.00090	0.00081	0.00081	0.00081	0.00079	0.00077	0.00081	0.00080	0.00084	0.00086	0.00081	0.00083	0.00079	0.00075	0.00073	0.00067	0.00090	0.00079	0.00075	0.00069	0.00068
Magnesium (Mg)-Dissolved	5.29	4.70	4.70	4.68	4.75	4.76	4.83	4.82	4.80	4.76	4.73	4.69	4.70	4.74	4.75	4.72	4.76	4.75	4.81	4.78	4.86	4.62	4.52
Manganese (Mn)-Dissolved	0.000994	0.00120	0.00119	0.00214	0.00141	0.00125	0.00126	0.00126	0.00113	0.00177	0.00117	0.00115	0.00121	0.00214	0.00118	0.00122	0.000721	0.000836	0.00347	0.00124	0.00103	0.000948	0.00101
Mercury (Hg)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00061	<0.00050	<0.00050	<0.0055	<0.0015	<0.0014	<0.00050	<0.00085	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050	<0.00060
Molybdenum (Mo)-Dissolved	0.000937	0.000569	0.000528	0.000535	0.000581	0.000579	0.000555	0.000557	0.000549	0.000541	0.000563	0.000577	0.000541	0.000559	0.000561	0.000551	0.000491	0.000486	0.00119	0.000565	0.000489	0.000517	0.000509
Nickel (Ni)-Dissolved	0.000230	0.000265	0.000279	0.000326	0.000278	0.000306	0.000287	0.000298	0.000284	0.000312	0.000310	0.000298	0.000270	0.000289	0.000271	0.000282	0.000336	0.000321	0.000334	0.000314	0.000310	0.000249	0.000271
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.784	0.666	0.673	0.665	0.684	0.670	0.675	0.669	0.671	0.658	0.668	0.648	0.657	0.664	0.666	0.668	0.589	0.598	0.735	0.605	0.599	0.683	0.690
Selenium (Se)-Dissolved	0.000248	0.000233	0.000239	0.000210	0.000426	0.000362	0.000323	0.000223	0.000225	0.000223	0.000284	0.000265	0.000302	0.000274	0.000263	0.000259	0.000177	0.000187	0.00225	0.000395	0.000222	0.000200	0.000201
Silicon (Si)-Dissolved	2.23	2.10	2.10	2.18	2.17	2.14	2.15	2.11	2.10	2.13	2.18	2.14	2.14	2.17	2.16	2.15	1.96	2.03	1.98	1.99	2.03	2.30	2.43
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	1.63	1.57	1.58	1.66	1.91	1.77	1.78	1.63	1.65	1.68	1.73	1.74	1.74	1.75	1.74	1.76	1.49	1.51	4.71	1.79	1.59	1.66	1.70
Strontium (Sr)-Dissolved	0.116	0.109	0.111	0.113	0.112	0.112	0.111	0.112	0.112	0.112	0.112	0.111	0.108	0.113	0.111	0.111	0.110	0.106	0.113	0.112	0.111	0.105	0.103
Thallium (Tl)-Dissolved	0.0000031	0.0000025	0.0000024	0.0000024	0.0000737	0.0000381	0.0000350	0.0000026	0.0000060	0.0000025	0.0000236	0.0000255	0.0000208	0.0000219	0.0000208	0.0000205	<0.0000020	<0.0000020	0.00104	0.000130	0.0000393	<0.0000020	<0.0000020
Tin (Sn)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000155	0.000029
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000462	0.000497	0.000517	0.000535	0.000521	0.000518	0.000529	0.000533	0.000512	0.000528	0.000531	0.000528	0.000515	0.000519	0.000521	0.000522	0.000491	0.000476	0.000491	0.000473	0.000485	0.000508	0.000504
Vanadium (V)-Dissolved	0.000110	0.000118	0.000115	0.000139	0.000138	0.000129	0.000136	0.000131	0.000147	0.000135	0.000131	0.000130	0.000150	0.000145	0.000143	0.000131	0.000087	0.000101	0.000099	0.000092	0.000104	0.000058	0.000069
Zinc (Zn)-Dissolved	0.00060	0.00112	0.00116	0.00222	0.00305	0.00216	0.00212	0.00121	0.00110	0.00136	0.00268	0.00209	0.00181	0.00179	0.00151	0.00183	0.00107	0.00198	0.0106	0.00190	0.00113	0.00312	0.00345
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

Sample ID	NEW BRIDGE GRAB	OLD BRIDGE GRAB	WANETA GRAB	BIRCHBANK GRAB	STONEY CREEK GRAB	NEW BRIDGE GRAB	OLD BRIDGE GRAB	WANETA GRAB
Site	**nb**	**ob**	**wa**	**bb**	**sc**	**nb**	**ob**	**wa**
Sample	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**	**r-sh**
TTS_Dist_CII	**230**	**1090**	**15800**	**-9720**	**-1975**	**230**	**1090**	**15800**
Date Sampled	09-APR-13	09-APR-13	09-APR-13	29-APR-13	29-APR-13	29-APR-13	29-APR-13	29-APR-13
Time Sampled	00:00	00:00	00:00	09:03	09:35	11:16	10:58	10:12
ALS Sample ID	L1288829-3	L1288829-4	L1288829-5	L1295778-1	L1295778-2	L1295778-5	L1295778-4	L1295778-3
Matrix	Water	Water	Water	Water	Water	Water	Water	Water
Physical Tests								
Conductivity	156	141	139	136	138	150	141	140
Hardness (as CaCO3)	68.6	66.9	67.2	69.3	69.0	71.5	70.1	71.0
pH	7.83	8.00	8.02	7.81	8.11	8.01	7.93	8.02
Total Suspended Solids	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	101	86	85	80	79	82	82	80
Turbidity	0.79	1.02	0.95	1.06	0.58	0.74	0.61	1.06
Anions and Nutrients								
Alkalinity, Total (as CaCO3)	54.5	55.0	54.4	61.0	60.6	61.7	62.5	62.5
Ammonia, Total (as N)	0.0425	0.0175	0.0092	<0.0050	0.0058	0.0324	0.0154	0.0079
Bromide (Br)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	1.20	0.97	0.89	0.77	0.81	1.01	0.84	0.84
Fluoride (F)	0.168	0.087	0.077	0.072	0.073	0.104	0.077	0.074
Nitrate (as N)	0.164	0.147	0.143	0.124	0.123	0.135	0.127	0.126
Nitrite (as N)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	0.094	0.071	0.072	0.074	0.079	0.120	0.097	0.081
Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total	0.0056	0.0054	0.0051	0.0043	0.0050	0.0037	0.0044	0.0038
Sulfate (SO4)	20.2	12.9	11.5	10.9	10.8	16.1	12.0	11.3
	1.37	1.49	1.58	1.92	1.56	1.65	1.56	1.64
Total Metals								
Mercury (Hg)-Total	<0.0033	<0.0011	<0.00078	<0.00050	<0.00060	<0.0044	<0.0015	<0.075
Total Metals (Undigested)								
Aluminum (Al)-Total	0.0199	0.0225	0.0224	0.0124	0.0139	0.0143	0.0142	0.0133
Antimony (Sb)-Total	0.000285	0.000150	0.000093	0.000036	0.000053	0.000790	0.000201	0.000111
Arsenic (As)-Total	0.000460	0.000334	0.000266	0.000246	0.000437	0.000395	0.000323	0.000274
Barium (Ba)-Total	0.0210	0.0200	0.0203	0.0207	0.0206	0.0209	0.0204	0.0209
Beryllium (Be)-Total	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Total	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Total	0.000797	0.000103	0.0000353	0.0000128	0.0000258	0.000279	0.0000705	0.0000290
Calcium (Ca)-Total	20.2	19.6	19.5	19.8	19.7	21.0	20.3	20.0
Chromium (Cr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Total	0.0000303	0.0000247	0.0000171	0.0000119	0.0000130	0.0000183	0.0000134	0.0000128
Copper (Cu)-Total	0.00069	0.00054	0.00047	0.00036	0.00031	0.00044	0.00040	0.00040
Iron (Fe)-Total	0.0194	0.0219	0.0228	0.0108	0.0119	0.0118	0.0122	0.0118
Lead (Pb)-Total	0.00164	0.000322	0.000187	0.0000700	0.0000935	0.000248	0.000235	0.000101
Lithium (Li)-Total	0.00096	0.00108	0.00087	0.00132	0.00077	0.00130	0.00128	0.00100
Magnesium (Mg)-Total	4.51	4.51	4.50	4.70	4.69	4.84	4.75	4.71
Manganese (Mn)-Total	0.00477	0.00312	0.00273	0.00212	0.00214	0.00398	0.00281	0.00242
Molybdenum (Mo)-Total	0.000610	0.000575	0.000521	0.000545	0.000535	0.000546	0.000554	0.000535
Nickel (Ni)-Total	0.000295	0.000322	0.000315	0.000237	0.000378	0.000242	0.000302	0.000264
Phosphorus (P)-Total	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	0.809	0.696	0.674	0.629	0.637	0.657	0.649	0.641
Selenium (Se)-Total	0.00127	0.000301	0.000226	0.000203	0.000205	0.000296	0.000231	0.000245
Silicon (Si)-Total	2.41	2.46	2.44	2.26	2.31	2.32	2.33	2.30
Silver (Ag)-Total	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Total	4.26	2.05	1.72	1.42	1.38	2.33	1.66	1.56
Strontium (Sr)-Total	0.111	0.112	0.108	0.113	0.110	0.109	0.109	0.109
Thallium (Tl)-Total	0.000296	0.0000638	0.0000169	0.0000030	0.0000029	0.000164	0.0000363	0.0000185
Tin (Sn)-Total	0.000023	<0.000010	0.000015	0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Total	0.00075	0.00094	0.00110	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Total	0.000512	0.000511	0.000511	0.000485	0.000498	0.000495	0.000502	0.000483
Vanadium (V)-Total	0.000120	0.000115	0.000099	0.000134	0.000120	0.000135	0.000140	0.000121
Zinc (Zn)-Total	0.0106	0.00409	0.00297	0.00179	0.00343	0.00555	0.00297	0.00174
Zirconium (Zr)-Total	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Dissolved Metals								
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved	0.00686	0.00765	0.00722	0.00617	0.00672	0.00700	0.00624	0.00569
Antimony (Sb)-Dissolved	0.000267	0.000153	0.000093	0.000041	0.000057	0.000764	0.000195	0.000108
Arsenic (As)-Dissolved	0.000423	0.000314	0.000245	0.000248	0.000412	0.000387	0.000324	0.000288
Barium (Ba)-Dissolved	0.0197	0.0199	0.0201	0.0208	0.0200	0.0202	0.0205	0.0203
Beryllium (Be)-Dissolved	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B)-Dissolved	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)-Dissolved	0.000786	0.0000929	0.0000316	0.0000120	0.0000250	0.000260	0.0000619	0.0000264
Calcium (Ca)-Dissolved	20.1	19.4	19.5	19.9	19.8	20.8	20.2	20.5
Chromium (Cr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	0.0000223	0.0000124	0.0000102	0.0000056	0.0000061	0.0000152	0.0000094	0.0000079
Copper (Cu)-Dissolved	0.00055	0.00039	0.00035	0.00025	0.00026	0.00047	0.00034	0.00034
Iron (Fe)-Dissolved	0.0040	0.0041	0.0042	0.0028	0.0027	0.0068	0.0028	0.0029
Lead (Pb)-Dissolved	0.000538	0.0000927	0.0000434	0.0000220	0.0000317	0.000149	0.0000524	0.0000382
Lithium (Li)-Dissolved	0.00106	0.00081	0.00081	0.00095	0.00110	0.00113	0.00102	0.00106
Magnesium (Mg)-Dissolved	4.48	4.46	4.52	4.75	4.74	4.75	4.77	4.85
Manganese (Mn)-Dissolved	0.00354	0.00169	0.00130	0.000841	0.000949	0.00265	0.00150	0.00118
Mercury (Hg)-Dissolved	<0.00080	<0.00050	<0.00050	<0.00050	<0.00050	<0.00080	<0.0011	<0.00050
Molybdenum (Mo)-Dissolved	0.000636	0.000543	0.000525	0.000520	0.000512	0.000557	0.000540	0.000551
Nickel (Ni)-Dissolved	0.000297	0.000269	0.000262	0.000227	0.000229	0.000255	0.000284	0.000248
Phosphorus (P)-Dissolved	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	0.804	0.671	0.678	0.619	0.639	0.647	0.642	0.668
Selenium (Se)-Dissolved	0.00125	0.000310	0.000227	0.000181	0.000206	0.000299	0.000217	0.000251
Silicon (Si)-Dissolved	2.33	2.37	2.39	2.23	2.32	2.26	2.28	2.33
Silver (Ag)-Dissolved	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)-Dissolved	4.22	2.08	1.74	1.42	1.43	2.39	1.71	1.53
Strontium (Sr)-Dissolved	0.111	0.106	0.109	0.111	0.104	0.108	0.111	0.112
Thallium (Tl)-Dissolved	0.000307	0.0000601	0.0000146	0.0000026	<0.0000020	0.000164	0.0000347	0.0000210
Tin (Sn)-Dissolved	<0.000010	<0.000010	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Titanium (Ti)-Dissolved	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U)-Dissolved	0.000521	0.000497	0.000506	0.000517	0.000484	0.000502	0.000483	0.000505
Vanadium (V)-Dissolved	0.000065	0.000080	0.000060	0.000113	0.000091	0.000100	0.000101	0.000099
Zinc (Zn)-Dissolved	0.00884	0.00363	0.00286	0.00139	0.00216	0.00530	0.00240	0.00185
Zirconium (Zr)-Dissolved	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0

APPENDIX C

CHLOROPHYLL A RESULTS

General Method	Analyte	Units	RDL										
LAB ID				2100777-01	2100777-02	2100777-03	2100777-04	2100777-05	2100777-06	2100777-07	2100777-08	2100777-09	2100777-10
ECO_ID				**ERO-REF-1-1**	**ERO-REF-1-2**	**ERO-REF-1-3**	**ERO-REF-1-4**	**ERO-REF-1-5**	**ERO-REF-2-1**	**ERO-REF-2-2**	**ERO-REF-2-3**	**ERO-REF-2-4**	**ERO-REF-2-5**
CIV_Dist(m)				-158	-180	367	502	756	-7207	-6932	-6895	-6733	-6404
CIII_Dist(m)				-1751	-1889	-1349	-1209	-949	-8778	-8503	-8466	-8304	-7975
CII_Dist(m)				-2167	-2293	-1765	-1614	-1404	-9271	-8996	-8959	-8797	-8468
DATE SAMPLED				14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12
DATE RECEIVED				15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12
MATRIX				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
General Parameters	Chlorophyll-a	ug/L	0.1	62	39	22	43	41	72	77	38	45	35

General Method	Analyte	Units	RDL										
LAB ID				2100777-11	2100777-12	2100777-13	2100777-14	2100777-15	2100777-16	2100777-17	2100777-18	2100777-19	2100777-20
ECO_ID				**ERO-EXP-1-1**	**ERO-EXP-1-2**	**ERO-EXP-1-3**	**ERO-EXP-1-4**	**ERO-EXP-1-5**	**ERO-EXP-2-1**	**ERO-EXP-2-2**	**ERO-EXP-2-3**	**ERO-EXP-2-4**	**ERO-EXP-2-5**
CIV_Dist(m)				199	294	857	977	1255	1635	1698	1731	1868	1760
CIII_Dist(m)				-1372	-1277	-714	-594	-316	64	127	160	297	189
CII_Dist(m)				-1865	-1770	-1207	-1087	-809	-429	-366	-333	-196	-304
DATE SAMPLED				14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12
DATE RECEIVED				15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12
MATRIX				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
General Parameters	Chlorophyll-a	ug/L	0.1	83	47	88	36	45	39	17	38	31	39

General Method	Analyte	Units	RDL										
LAB ID				2100777-21	2100777-22	2100777-23	2100777-24	2100777-25	2100777-26	2100777-27	2100777-28	2100777-29	2100777-30
ECO_ID				**ERO-EXP-3-1**	**ERO-EXP-3-2**	**ERO-EXP-3-3**	**ERO-EXP-3-4**	**ERO-EXP-3-5**	**ERO-EXP-4-1**	**ERO-EXP-4-2**	**ERO-EXP-4-3**	**ERO-EXP-4-4**	**ERO-EXP-4-5**
CIV_Dist(m)				2201	3131	3624	4339	4864	5274	5612	5646	6104	6614
CIII_Dist(m)				630	1560	2053	2768	3293	3703	4041	4075	4533	5043
CII_Dist(m)				137	1067	1560	2275	2800	3210	3548	3582	4040	4550
DATE SAMPLED				14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12
DATE RECEIVED				15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12
MATRIX				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
General Parameters	Chlorophyll-a	ug/L	0.1	55	84	131	63	54	28	51	14	53	23

General Method	Analyte	Units	RDL								
LAB ID				2100777-31	2100777-32	2100777-33	2100777-34	2100777-35	2100777-36	2100777-37	2100777-38
ECO_ID				**ERO-EXP-5-1**	**ERO-EXP-5-2**	**ERO-EXP-5-3**	**ERO-EXP-5-4**	**ERO-EXP-5-5**	**FD-5-1**	**FD-5-2**	**FD-5-3**
CIV_Dist(m)				8737	9199	16697	17249	18749			
CIII_Dist(m)				7166	7628	15126	15678	17178			
CII_Dist(m)				6673	7135	14633	15185	16685			
DATE SAMPLED				14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12
DATE RECEIVED				15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12
MATRIX				Water	Water	Water	Water	Water	Water	Water	Water
General Parameters	Chlorophyll-a	ug/L	0.1	39	67	33	62	14	84	59	66

APPENDIX D

SEDIMENT QUALITY DATA

Depositional Sediment Chemistry													
			Lab ID	2100801-01	2100801-02	2100801-03	2100801-04	2100801-05	2100801-06	2100801-07	2100801-08	2100801-09	2100801-10
			Client ID	DEP-REF-1 Kootenay E	DEP-REF-2 Genelle	DEP-REF-3 Birchbank	DEP-EXP-1 Korpac	DEP-EXP-2 Maglios	DEP-EXP-3 Casino	DEP-EXP-4 Airport B	DEP-EXP-5 Trimac	DEP-EXP-6 Ft. S	DEP-EXP-7 Waneta
			Date Sampled	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12	14-Oct-12
			Date Received	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12	15-Oct-12
MATRIX	Analyte	Unit	RDL	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid
General Parameters	Carbon, Total Organic	%	0.05	0.35	0.5	0.11	0.22	0.09	0.26	0.21	0.14	0.2	0.57
General Parameters	Moisture	% rec	0.1	21.6	25.4	20.1	18.2	20.4	24.6	18.5	23.6	22.4	17.5
Particle Size Distribution Analysis	Sand	%	2	97	92	98	94	98	92	97	95	95	99
Particle Size Distribution Analysis	Silt	%	2	2	5	<2	5	<2	7	2	5	5	<2
Particle Size Distribution Analysis	Clay	%	2	2	3	2	2	2	2	2	<2	<2	<2
Particle Size Distribution Analysis	Texture	%		Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand	Sand
Strong Acid Leachable Metals	Aluminum	mg/kg dry	20	4000	4100	3000	5400	7800	6400	7500	6000	5600	7400
Strong Acid Leachable Metals	Antimony	mg/kg dry	0.1	<0.1	0.2	<0.1	11	120	63	25	39	29	10
Strong Acid Leachable Metals	Arsenic	mg/kg dry	0.4	0.8	1.1	0.6	7.1	14	11	7	9.6	5.9	4.9
Strong Acid Leachable Metals	Barium	mg/kg dry	1	38	45	23	130	440	240	140	240	210	180
Strong Acid Leachable Metals	Beryllium	mg/kg dry	0.1	0.2	0.2	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Strong Acid Leachable Metals	Bismuth	mg/kg dry	0.1	<0.1	<0.1	<0.1	0.3	0.1	0.2	0.1	0.2	0.1	0.5
Strong Acid Leachable Metals	Boron	mg/kg dry	2	<2	<2	<2	<2	17	6	3	7	5	<2
Strong Acid Leachable Metals	Cadmium	mg/kg dry	0.04	0.23	0.3	0.09	1.7	0.5	1.1	0.5	1.1	0.71	1.2
Strong Acid Leachable Metals	Calcium	mg/kg dry	100	2300	2400	1700	3400	18000	8700	5600	9400	7600	13000
Strong Acid Leachable Metals	Chromium	mg/kg dry	1	18	15	15	19	39	31	24	30	25	34
Strong Acid Leachable Metals	Cobalt	mg/kg dry	0.1	3	3	2.2	5.4	17	9.2	9.1	9.3	9	8
Strong Acid Leachable Metals	Copper	mg/kg dry	0.2	5.8	6.3	4	120	670	370	180	320	250	100
Strong Acid Leachable Metals	Iron	mg/kg dry	20	13000	11000	11000	18000	54000	35000	25000	36000	26000	26000
Strong Acid Leachable Metals	Lead	mg/kg dry	0.2	7.8	9.9	4.9	170	100	160	62	130	83	73
Strong Acid Leachable Metals	Lithium	mg/kg dry	0.1	9.2	8.8	5.9	8.1	8.8	9.3	9.8	7.4	8.3	8.5
Strong Acid Leachable Metals	Magnesium	mg/kg dry	10	2600	2700	2100	3000	3600	3200	4600	2900	3200	7700
Strong Acid Leachable Metals	Manganese	mg/kg dry	0.4	120	130	150	190	1100	560	430	550	450	390
Strong Acid Leachable Metals	Mercury	mg/kg dry	0.05	<0.05	<0.05	<0.05	0.19	0.12	0.21	0.08	0.16	0.07	0.05
Strong Acid Leachable Metals	Molybdenum	mg/kg dry	0.1	0.2	0.2	0.1	1	8.5	2.7	1.7	3.2	2.4	1.8
Strong Acid Leachable Metals	Nickel	mg/kg dry	0.4	9.1	9.7	6.1	10	10	14	12	10	11	18
Strong Acid Leachable Metals	Phosphorus	mg/kg dry	10	650	630	390	790	550	830	700	830	870	1000
Strong Acid Leachable Metals	Potassium	mg/kg dry	10	790	810	420	910	1300	1100	980	960	990	1300
Strong Acid Leachable Metals	Selenium	mg/kg dry	0.5	<0.5	<0.5	<0.5	0.6	1	0.8	<0.5	0.8	0.6	<0.5
Strong Acid Leachable Metals	Silicon	mg/kg dry	3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000
Strong Acid Leachable Metals	Silver	mg/kg dry	0.2	<0.2	<0.2	<0.2	0.6	5.7	2.6	0.8	2.1	1.4	0.9
Strong Acid Leachable Metals	Sodium	mg/kg dry	40	83	93	97	140	540	260	220	280	240	260
Strong Acid Leachable Metals	Strontium	mg/kg dry	0.2	21	28	18	28	76	49	41	50	45	58
Strong Acid Leachable Metals	Sulfur	mg/kg dry	1000	<1000	<1000	<1000	<1000	1100	<1000	<1000	<1000	<1000	<1000
Strong Acid Leachable Metals	Tellurium	mg/kg dry	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3
Strong Acid Leachable Metals	Thallium	mg/kg dry	0.1	<0.1	<0.1	<0.1	0.4	<0.1	0.2	0.1	0.2	0.2	0.2
Strong Acid Leachable Metals	Thorium	mg/kg dry	0.5	3.5	3.4	3.9	4.6	3.3	4.3	3.1	4.3	4.1	4.3
Strong Acid Leachable Metals	Tin	mg/kg dry	0.2	0.4	0.4	0.2	13	73	45	17	43	27	11
Strong Acid Leachable Metals	Titanium	mg/kg dry	2	460	430	250	500	560	640	620	510	530	620
Strong Acid Leachable Metals	Uranium	mg/kg dry	0.1	1	1	0.6	1.1	2.1	1.8	0.9	1.1	1	1.3
Strong Acid Leachable Metals	Vanadium	mg/kg dry	0.4	31	24	27	27	26	38	41	30	29	49
Strong Acid Leachable Metals	Zinc	mg/kg dry	2	71	70	38	650	4200	2200	930	2400	1400	780
Strong Acid Leachable Metals	Zirconium	mg/kg dry	2	<2	<2	<2	3	12	6	4	7	5	3

APPENDIX E

PERIPHYTON TAXONOMIC DATA

Periphyton: Live Biovolume

ECO_ID	Year	Season	Reach	Site	Transect	P001	P002	P003	P004	P005	P006	P007	P008	P009	P010	P011	P012	P013	P014	P015	P016	P017	P018	P019	P020	P021	P022	P023	P024	P025	P026	P027	P028	P029	P030	P031	P032	P033	P034	P035	P036	P037	P038	P039	P040	P041	P042
DEP-EXP-1-1	2012	Fall	EXP	DEP	KO-1	380770	765310	0	1918930	0	214890	0	0	0	0	0	0	0	1524588	1025440	0	0	167388	181714	0	0	3506100	0	0	0	252590	0	0	693680	1108380	0	227708	0	3619200	19528600	0	2482168	0	0	0	0	0
DEP-EXP-1-2	2012	Fall	EXP	DEP	KO-2	533078	1715350	0	1918930	0	0	0	0	0	0	0	0	0	1016392	2563600	0	0	502164	363428	0	0	9466470	0	0	2970760	0	0	0	346840	6650280	0	227708	0	2262000	13391040	0	3723252	2940600	0	0	0	0
DEP-EXP-1-3	2012	Fall	EXP	DEP	KO-3	380770	923650	0	1918930	0	71630	0	0	0	0	0	0	0	1524588	1025440	0	0	83694	181714	0	0	5259150	0	0	0	252590	0	0	346840	2216760	0	227708	0	904800	10043280	0	2482168	2352480	0	0	0	0
DEP-EXP-2-1	2012	Fall	EXP	DEP	MG-1	76154	237510	0	0	0	143260	0	2438436	0	0	0	0	1909882	0	0	0	0	334776	181714	2672176	0	3856710	0	0	0	0	0	0	0	0	0	0	0	3166800	15622880	0	2482168	1176240	0	0	0	0
DEP-EXP-2-2	2012	Fall	EXP	DEP	MG-2	228462	923650	0	767572	0	143260	0	1219218	0	0	0	0	9549410	0	0	0	0	669552	908570	2672176	0	5609760	0	0	0	0	0	0	0	3325140	0	0	0	14476800	3347760	0	3723252	2940600	0	0	0	0
DEP-EXP-2-3	2012	Fall	EXP	DEP	MG-3	228462	131950	0	767572	0	71630	0	7315308	0	0	0	0	0	0	3589040	0	0	1339104	908570	5344352	0	4908540	0	0	1188304	0	0	0	346840	0	0	0	0	12214800	26782080	0	4964336	588120	0	0	0	0
DEP-EXP-3-1	2012	Fall	EXP	DEP	C-1	228462	343070	0	1151358	0	143260	1379820	0	369460	0	0	0	0	2540980	1538160	0	0	1255410	181714	0	0	1051830	0	0	0	0	17648878	0	346840	2216760	0	0	0	5881200	13949000	0	3723252	1764360	7057440	0	0	0
DEP-EXP-3-2	2012	Fall	EXP	DEP	C-2	228462	369460	0	1151358	0	71630	0	0	0	0	0	0	0	508196	1025440	0	0	418470	0	0	0	350610	0	0	0	0	0	0	0	3325140	0	0	0	2714400	0	0	8687588	0	0	0	0	0
DEP-EXP-3-3	2012	Fall	EXP	DEP	C-3	0	158340	0	1151358	0	286520	0	0	0	0	0	0	0	0	512720	0	0	418470	363428	0	0	1753050	0	0	0	0	0	0	0	1108380	0	0	0	3619200	6137560	0	4964336	0	0	0	0	0
DEP-EXP-4-1	2012	Fall	EXP	DEP	AB-1	152308	501410	0	3070288	0	214890	0	0	369460	0	0	2033538	0	2540980	1025440	0	0	334776	0	2672176	0	3856710	0	0	0	1515540	17648878	0	0	11083800	0	0	0	1809600	6137560	0	8687588	1764360	0	0	0	0
DEP-EXP-4-2	2012	Fall	EXP	DEP	AB-2	304616	448630	0	1535144	0	143260	0	0	0	0	0	4067076	0	1016392	512720	0	0	418470	0	0	0	4557930	0	0	594152	0	0	0	0	1108380	0	0	0	0	2231840	0	4964336	1764360	0	0	0	0
DEP-EXP-4-3	2012	Fall	EXP	DEP	AB-3	380770	475020	0	1151358	0	143260	0	0	0	0	0	2033538	0	2032784	512720	0	0	920634	0	0	0	2103660	0	0	594152	0	0	0	0	4433520	0	0	0	3166800	11159200	0	3723252	2940600	0	0	0	0
DEP-EXP-5-1	2012	Fall	EXP	DEP	TR-1	533078	1319500	0	767572	0	214890	0	0	369460	0	0	0	0	0	3076320	0	0	1255410	0	2672176	0	701220	0	0	0	0	0	0	0	2216760	0	0	0	2714400	2231840	0	0	4116840	0	0	0	0
DEP-EXP-5-2	2012	Fall	EXP	DEP	TR-2	228462	897260	0	0	0	71630	0	0	0	0	0	0	0	1524588	5127200	0	0	1924962	0	8016528	0	1051830	0	0	0	1010360	0	0	0	5541900	0	227708	0	6333600	4463680	0	6205420	3528720	0	0	0	0
DEP-EXP-5-3	2012	Fall	EXP	DEP	TR-3	799617	950040	0	383786	0	179075	0	1219218	369460	0	0	1016769	0	2032784	2563600	0	0	251082	0	0	0	350610	0	0	297076	0	8824439	0	0	2770950	0	0	0	2714400	5021640	0	1861626	2352480	0	0	0	0
DEP-EXP-6-1	2012	Fall	EXP	DEP	FS-1	380770	1108380	0	0	0	71630	0	0	0	0	0	0	0	1524588	512720	0	0	0	181714	0	0	350610	0	0	594152	0	0	0	0	2216760	0	0	0	0	10601240	0	1241084	588120	0	0	0	0
DEP-EXP-6-2	2012	Fall	EXP	DEP	FS-2	1066156	395850	0	383786	0	0	0	0	0	0	0	0	0	2540980	0	0	0	0	181714	0	0	350610	940992	0	594152	0	0	0	346840	0	0	0	0	1809600	1673880	0	0	1764360	0	0	0	0
DEP-EXP-6-3	2012	Fall	EXP	DEP	FS-3	1066156	659750	0	383786	0	143260	0	0	0	0	0	0	0	1016392	0	0	0	0	0	0	0	350610	470496	0	1188304	252590	0	0	0	0	0	0	0	0	0	0	1241084	588120	0	0	0	0
DEP-EXP-7-1	2012	Fall	EXP	DEP	WA-1	0	131950	0	383786	0	71630	0	0	0	0	0	0	0	508196	0	0	0	83694	0	0	0	701220	0	0	1782456	0	0	0	0	2216760	0	0	0	0	0	0	0	1176240	0	0	0	0
DEP-EXP-7-2	2012	Fall	EXP	DEP	WA-2	0	79170	0	0	0	143260	0	0	0	0	0	0	0	0	0	0	0	251082	0	0	0	701220	0	0	594152	0	0	0	0	3325140	0	0	0	0	1115920	0	0	588120	0	0	0	0
DEP-EXP-7-3	2012	Fall	EXP	DEP	WA-3	0	131950	0	0	0	71630	0	0	0	0	0	0	0	2032784	512720	0	0	669552	0	0	0	701220	470496	0	594152	0	0	0	346840	1108380	0	227708	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-1	2012	Fall	REF	DEP	KE-1	152308	211120	0	767572	0	286520	0	0	0	0	0	0	0	508196	2563600	0	0	2092350	0	0	0	0	0	0	594152	0	0	0	346840	3325140	0	0	0	9500400	6137560	0	1241084	588120	5428800	0	0	0
DEP-REF-1-2	2012	Fall	REF	DEP	KE-2	0	79170	0	0	0	286520	0	0	0	0	0	0	0	2540980	0	0	0	2761902	181714	0	0	0	0	0	0	0	0	0	0	2216760	0	0	0	0	3347760	0	8687588	588120	10857600	0	0	0
DEP-REF-1-3	2012	Fall	REF	DEP	KE-3	0	105560	0	0	0	358150	0	0	0	0	0	0	0	3557372	2563600	0	0	1757574	181714	0	0	1051830	470496	0	0	0	0	0	346840	5541900	0	0	0	7238400	8369400	0	1241084	1176240	0	0	0	0
DEP-REF-2-1	2012	Fall	REF	DEP	GE-1	0	105560	0	0	0	143260	0	1219218	0	0	0	0	0	1524588	1538160	0	0	334776	0	2672176	0	0	0	0	0	0	0	0	0	2216760	0	227708	0	2714400	16180840	0	0	0	0	0	0	0
DEP-REF-2-2	2012	Fall	REF	DEP	GE-2	0	52780	0	0	0	71630	0	7315308	0	0	0	0	0	508196	0	0	0	418470	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4071600	0	0	1241084	0	0	0	0	0
DEP-REF-2-3	2012	Fall	REF	DEP	GE-3	0	105560	0	0	0	143260	0	2438436	0	0	0	0	0	508196	0	0	0	334776	181714	0	0	350610	0	0	0	0	17648878	0	0	2216760	0	455416	0	452400	6137560	0	2482168	0	0	0	0	0
DEP-REF-3-1	2012	Fall	REF	DEP	BB-1	0	158340	0	383786	0	143260	0	0	0	0	0	0	0	1524588	1025440	0	0	1088022	0	0	0	350610	0	0	594152	0	0	0	0	2216760	0	455416	0	8595600	0	0	1241084	588120	0	0	0	0
DEP-REF-3-2	2012	Fall	REF	DEP	BB-2	152308	263900	0	0	0	143260	0	1219218	0	0	0	0	0	0	512720	0	0	251082	363428	0	0	350610	940992	0	594152	0	0	0	0	1108380	0	0	0	3166800	0	0	1241084	588120	0	0	0	0
DEP-REF-3-3	2012	Fall	REF	DEP	BB-3	76154	52780	0	0	0	71630	0	0	0	0	0	0	0	0	0	0	0	920634	0	0	0	0	0	0	0	505180	0	0	0	3325140	0	0	0	4976400	0	0	0	1176240	0	0	0	0
ERO-EXP-1-1A	2012	Fall	EXP	ERO	1-1A	152308	475020	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	188500	334776	363428	0	0	0	0	0	2970760	252590	0	0	0	0	0	227708	0	0	0	0	0	2940600	0	0	0	0
ERO-EXP-1-1B	2012	Fall	EXP	ERO	1-1B	228462	633360	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	113100	0	0	0	0	701220	0	0	594152	252590	0	0	0	0	0	227708	0	452400	0	0	0	2352480	0	0	0	0
ERO-EXP-1-1C	2012	Fall	EXP	ERO	1-1C	152308	527800	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	113100	251082	363428	0	0	701220	0	0	0	0	17648878	0	0	0	0	0	0	0	0	0	0	8821800	0	0	199056	0
ERO-EXP-1-2A	2012	Fall	EXP	ERO	1-2A	228462	316680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37700	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	22936680	0	0	0	0
ERO-EXP-1-2B	2012	Fall	EXP	ERO	1-2B	76154	475020	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	37700	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14114880	0	0	0	0
ERO-EXP-1-2C	2012	Fall	EXP	ERO	1-2C	152308	237510	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	75400	83694	726856	0	0	0	0	0	0	0	17648878	0	0	0	0	0	0	452400	0	0	0	12938640	0	0	0	0
ERO-EXP-1-3A	2012	Fall	EXP	ERO	1-3A	2970006	1609790	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	113100	251082	0	2672176	0	1051830	0	0	2376608	252590	17648878	0	0	0	0	455416	0	1809600	0	0	1241084	2352480	0	0	0	0
ERO-EXP-1-3B	2012	Fall	EXP	ERO	1-3B	228462	738920	0	0	0	0	0	0	0	2797340	0	0	0	0	0	0	113100	0	181714	0	0	1402440	0	0	594152	0	17648878	0	0	0	0	0	0	0	0	0	4964336	10586160	0	0	0	0
ERO-EXP-1-3C	2012	Fall	EXP	ERO	1-3C	1523080	950040	0	0	0	0	0	0	0	0	0	0	0	2032784	512720	0	37700	334776	181714	0	0	350610	0	0	0	0	0	0	0	0	0	227708	0	904800	0	0	0	3528720	0	0	0	0
ERO-EXP-1-4A	2012	Fall	EXP	ERO	1-4A	456924	422240	0	0	0	0	0	0	0	0	0	0	0	1524588	1538160	0	75400	167388	0	0	0	0	0	0	0	0	17648878	0	346840	0	0	0	0	904800	0	0	1241084	9409920	0	0	0	0
ERO-EXP-1-4B	2012	Fall	EXP	ERO	1-4B	380770	501410	0	0	0	0	0	0	0	0	0	0	0	1524588	0	0	37700	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2482168	4704960	0	0	0	0
ERO-EXP-1-4C	2012	Fall	EXP	ERO	1-4C	990002	1134770	0	0	0	0	0	0	0	0	0	0	0	2032784	512720	0	75400	83694	545142	0	0	350610	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	1241084	2940600	0	923650	0	0
ERO-EXP-1-5A	2012	Fall	EXP	ERO	1-5A	609232	897260	0	0	0	0	0	0	0	0	0	0	0	4573764	512720	0	113100	0	0	0	0	1402440	0	0	2376608	0	0	0	0	0	0	0	0	1809600	0	0	0	588120	0	0	0	0
ERO-EXP-1-5B	2012	Fall	EXP	ERO	1-5B	228462	897260	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	37700	0	181714	0	0	1051830	0	0	2376608	505180	0	0	0	0	0	0	0	1809600	0	0	0	1176240	0	0	0	0
ERO-EXP-1-5C	2012	Fall	EXP	ERO	1-5C	228462	580580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	363428	0	0	0	0	0	1188304	0	0	0	0	0	0	0	0	4976400	0	0	1241084	588120	0	0	0	0
ERO-EXP-2-1A	2012	Fall	EXP	ERO	2-1A	761540	1213940	0	383786	0	0	0	0	0	0	0	0	0	1016392	512720	0	0	83694	0	0	0	701220	0	0	1782456	0	0	0	0	1108380	0	0	0	904800	0	0	0	1764360	0	0	0	0
ERO-EXP-2-1B	2012	Fall	EXP	ERO	2-1B	76154	395850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1C	2012	Fall	EXP	ERO	2-1C	0	554190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1115920	0	0	0	0	0	0	0
ERO-EXP-2-2A	2012	Fall	EXP	ERO	2-2A	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	557960	0	0	588120	0	0	0	0
ERO-EXP-2-2B	2012	Fall	EXP	ERO	2-2B	0	369460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2C	2012	Fall	EXP	ERO	2-2C	0	211120	0	0	0	0	0	0	738920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	342316	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3A	2012	Fall	EXP	ERO	2-3A	228462	1583400	0	0	0	0	0	0	738920	0	0	0	0	508196	1025440	0	0	585858	0	0	0	1051830	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3B	2012	Fall	EXP	ERO	2-3B	0	475020	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0	0	0
ERO-EXP-2-3C	2012	Fall	EXP	ERO	2-3C	76154	316680	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4A	2012	Fall	EXP	ERO	2-4A	228462	1477840	0	0	0	0	0	0	0	0	0	0	0	1016392	1025440	0	0	0	0	0	0	0	0	0	1188304	0	0	0	0	0	0	0	0	0	1115920	0	0	588120	0	0	0	0
ERO-EXP-2-4B	2012	Fall	EXP	ERO	2-4B	152308	369460	0	0	0	0	0	0	369460	0	0	0	0	0	0	0	0	251082	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	0	7253480	0	0	1764360	0	0	0	0
ERO-EXP-2-4C	2012	Fall	EXP	ERO	2-4C	228462	290290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	418470	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176240	0	0	0	0
ERO-EXP-2-5A	2012	Fall	EXP	ERO	2-5A	1142310	1134770	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	334776	0	0	0	1051830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0	0	0
ERO-EXP-2-5B	2012	Fall	EXP	ERO	2-5B	380770	765310	0	383786	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	0	6137560	0	0	2352480	0	0	398112	0
ERO-EXP-2-5C	2012	Fall	EXP	ERO	2-5C	76154	686140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	502164	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	2262000	0	0	0	2940600	0	0	0	0
ERO-EXP-3-1A	2012	Fall	EXP	ERO	3-1A	609232	2348710	0	383786	0	0	0	0	0	0	0	0	0	0	0	0	0	1088022	545142	0	0	1753050	0	0	594152	0	0	0	346840	1108380	0	227708	0	2262000	0	0	0	2352480	0	0	0	0
ERO-EXP-3-1B	2012	Fall	EXP	ERO	3-1B	456924	1002820	0	0	0	0	0	0	369460	0	0	0	0	0	512720	0	0	585858	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	452400	0	0	1241084	1176240	0	0	0	0
ERO-EXP-3-1C	2012	Fall	EXP	ERO	3-1C	456924	1002820	0	767572	0	0	0	0	369460	0	0	0	0	0	512720	0	0	836940	0	2672176	0	1402440	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	3723252	588120	0	0	0	0
ERO-EXP-3-2A	2012	Fall	EXP	ERO	3-2A	533078	633360	0	0	0	0	0	0	369460	0	0	0	0	508196	1538160	0	0	1088022	545142	0	0	1051830	0	0	594152	0	17648878	0	0	0	0	455416	0	3619200	0	0	2482168	5293080	0	0	0	0
ERO-EXP-3-2B	2012	Fall	EXP	ERO	3-2B	304616	738920	0	0	0	0	0	0	0	0	0	0	0	1524588	512720	0	0	836940	726856	0	0	0	0	0	594152	0	17648878	0	0	0	0	0	0	0	0	0	0	8233680	0	0	0	0
ERO-EXP-3-2C	2012	Fall	EXP	ERO	3-2C	304616	686140	0	0	0	0	1379820	0	0	0	0	0	0	2032784	1025440	0	75400	1506492	545142	0	0	0	0	0	0	0	0	0	346840	0	0	455416	0	6333600	0	0	0	8233680	0	0	0	0
ERO-EXP-3-3A	2012	Fall	EXP	ERO	3-3A	533078	1398670	0	767572	0	0	0	1219218	0	0	0	0	0	0	1538160	0	75400	0	0	2672176	0	2103660	0	0	14259648	252590	0	0	0	0	0	0	0	2262000	2231840	0	2482168	1764360	0	0	0	0
ERO-EXP-3-3B	2012	Fall	EXP	ERO	3-3B	1218464	1504230	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	75400	0	0	2672176	0	1753050	0	0	4159064	252590	0	0	0	0	0	227708	0	0	6695520	0	1241084	4116840	0	0	0	0
ERO-EXP-3-3C	2012	Fall	EXP	ERO	3-3C	456924	976430	0	0	0	0	0	0	0	0	0	0	0	0	2050880	0	150800	0	181714	0	0	4557930	0	0	5347368	0	0	0	0	0	0	227708	0	452400	1115920	0	1241084	1764360	0	0	0	0
ERO-EXP-3-4A	2012	Fall	EXP	ERO	3-4A	2132312	5621070	0	0	0	0	0	2438436	0	0	0	0	0	0	3076320	0	0	0	0	2672176	0	1051830	0	0	4753216	0	0	0	0	0	0	0	0	0	2231840	0	0	7645560	0	0	0	0
ERO-EXP-3-4B	2012	Fall	EXP	ERO	3-4B	609232	2058420	0	0	0	0	0	0	0	0	0	0	0	508196	1025440	0	150800	0	0	0	0	701220	0	0	594152	0	0	0	0	0	0	0	0	1357200	2231840	0	0	9998040	0	0	199056	0
ERO-EXP-3-4C	2012	Fall	EXP	ERO	3-4C	609232	4169620	147030	0	0	0	0	1219218	0	0	0	0	0	508196	2050880	0	0	0	0	0	0	701220	0	0	1188304	252590	0	0	0	3325140	0	0	0	0	1115920	0	0	5293080	0	0	0	0
ERO-EXP-3-5A	2012	Fall	EXP	ERO	3-5A	380770	659750	11310	0	0	0	0	1219218	0	0	0	0	0	0	0	0	37700	167388	0	0	0	0	0	0	2376608	0	0	0	0	0	0	0	0	904800	8927360	0	6205420	3528720	0	0	0	0
ERO-EXP-3-5B	2012	Fall	EXP	ERO	3-5B	228462	686140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	251082	0	0	0	701220	0	0	1782456	505180	0	0	0	3325140	0	0	0	0	0	0	2482168	1764360	0	0	0	0
ERO-EXP-3-5C	2012	Fall	EXP	ERO	3-5C	456924	897260	0	0	0	0	0	1219218	0	0	0	0	0	0	3076320	0	0	669552	0	0	0	2804880	0	0	2970760	0	0	0	0	2216760	0	0	0	0	1115920	0	4964336	5293080	0	0	0	0
ERO-EXP-4-1A	2012	Fall	EXP	ERO	4-1A	380770	791700	11310	0	0	0	0	0	369460	0	0	0	0	1016392	1538160	0	75400	0	0	0	0	0	0	0	1782456	0	0	0	0	0	0	227708	0	1357200	0	0	0	588120	0	0	0	0
ERO-EXP-4-1B	2012	Fall	EXP	ERO	4-1B	304616	580580	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	6469320	0	0	0	0
ERO-EXP-4-1C	2012	Fall	EXP	ERO	4-1C	304616	738920	0	0	0	0	0	1219218	369460	0	0	0	0	1016392	0	0	0	0	363428	0	0	0	0	0	2376608	0	0	0	0	2216760	0	0	0	0	0	0	0	15291120	0	0	0	0
ERO-EXP-4-2A	2012	Fall	EXP	ERO	4-2A	0	211120	0	383786	0	0	0	0	0	0	0	0	0	508196	0	0	113100	0	0	0	0	0	0	0	0	0	0	0	346840	0	0	0	0	2714400	2231840	0	0	9409920	0	0	0	0
ERO-EXP-4-2B	2012	Fall	EXP	ERO	4-2B	228462	501410	11310	0	0	0	0	1219218	0	0	0	0	0	508196	512720	0	75400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1241084	1764360	0	0	0	0
ERO-EXP-4-2C	2012	Fall	EXP	ERO	4-2C	152308	686140	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	150800	0	0	0	0	0	0	0	1188304	0	0	0	0	1108380	0	0	0	3166800	0	0	0	2940600	0	0	0	0
ERO-EXP-4-3A	2012	Fall	EXP	ERO	4-3A	76154	263900	0	0	0	0	0	0	369460	0	0	0	0	0	1025440	0	150800	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0	0	0
ERO-EXP-4-3B	2012	Fall	EXP	ERO	4-3B	456924	554190	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	1241084	1176240	0	0	0	0
ERO-EXP-4-3C	2012	Fall	EXP	ERO	4-3C	152308	501410	0	0	0	0	0	0	0	0	0	0	0	508196	1025440	0	113100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2352480	0	0	0	0
ERO-EXP-4-4A	2012	Fall	EXP	ERO	4-4A	990002	1583400	0	0	0	0	0	2438436	0	0	0	0	0	508196	2563600	0	75400	0	0	0	0	0	0	0	1782456	0	0	0	0	0	0	0	0	452400	2231840	0	1241084	588120	0	0	0	0
ERO-EXP-4-4B	2012	Fall	EXP	ERO	4-4B	913848	1240330	0	0	0	0	0	0	0	559468	0	0	0	1016392	1025440	0	113100	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	227708	0	1809600	0	0	1241084	4116840	0	0	0	0
ERO-EXP-4-4C	2012	Fall	EXP	ERO	4-4C	609232	1425060	0	0	0	0	0	2438436	0	0	0	0	0	508196	1025440	0	75400	0	0	2672176	0	0	470496	0	0	0	0	0	0	1108380	0	227708	0	452400	1673880	0	4964336	1176240	0	0	0	0
ERO-EXP-4-5A	2012	Fall	EXP	ERO	4-5A	380770	765310	0	0	0	0	0	0	0	0	0	0	0	1016392	512720	0	37700	0	0	0	0	0	0	0	1188304	252590	0	0	0	0	0	455416	0	0	0	0	2482168	7645560	0	0	0	0
ERO-EXP-4-5B	2012	Fall	EXP	ERO	4-5B	0	290290	0	0	0	0	0	0	0	0	0	0	0	0	2050880	0	113100	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	227708	0	0	0	0	0	4704960	0	0	0	0
ERO-EXP-4-5C	2012	Fall	EXP	ERO	4-5C	0	316680	11310	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	0	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	1241084	0	0	0	199056	0
ERO-EXP-5-1A	2012	Fall	EXP	ERO	5-1A	152308	158340	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	363428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	6695520	0	0	19996080	0	0	0	0
ERO-EXP-5-1B	2012	Fall	EXP	ERO	5-1B	380770	395850	0	0	0	0	0	1219218	0	0	0	0	0	508196	512720	0	0	0	363428	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	904800	3347760	0	0	7057440	0	0	0	0
ERO-EXP-5-1C	2012	Fall	EXP	ERO	5-1C	0	211120	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	1115920	0	1241084	15291120	0	0	0	0

Periphyton: Live Biovolume

ECO_ID	Year	Season	Reach	Site	Transect	P001	P002	P003	P004	P005	P006	P007	P008	P009	P010	P011	P012	P013	P014	P015	P016	P017	P018	P019	P020	P021	P022	P023	P024	P025	P026	P027	P028	P029	P030	P031	P032	P033	P034	P035	P036	P037	P038	P039	P040	P041	P042
ERO-EXP-5-2A	2012	Fall	EXP	ERO	5-2A	2132312	1029210	0	0	0	0	0	1219218	0	0	0	0	0	1016392	512720	0	0	0	0	0	0	1402440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1241084	2352480	0	0	0	0
ERO-EXP-5-2B	2012	Fall	EXP	ERO	5-2B	1142310	1345890	0	1151358	0	0	0	6096090	369460	0	0	0	0	1524588	3589040	0	0	0	545142	0	0	1402440	0	0	594152	0	0	0	0	0	0	227708	0	904800	6695520	0	2482168	1764360	0	0	0	0
ERO-EXP-5-2C	2012	Fall	EXP	ERO	5-2C	1599234	1451450	0	383786	0	0	0	3657654	0	0	0	0	0	1016392	1025440	0	37700	0	0	0	0	3155490	0	0	0	0	0	0	0	0	0	227708	0	1809600	7811440	0	2482168	1176240	0	0	199056	0
ERO-EXP-5-3A	2012	Fall	EXP	ERO	5-3A	1218464	1900080	0	0	0	0	0	1219218	0	0	0	0	0	0	0	0	0	0	0	0	0	1051830	0	0	2376608	0	0	0	346840	0	0	0	0	1809600	0	0	0	0	0	0	0	0
ERO-EXP-5-3B	2012	Fall	EXP	ERO	5-3B	837694	1451450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1188304	0	0	0	0	0	0	0	0	0	2231840	0	2482168	4704960	0	0	0	0
ERO-EXP-5-3C	2012	Fall	EXP	ERO	5-3C	1066156	1240330	0	383786	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	1051830	0	0	3564912	0	0	0	0	0	0	0	0	3166800	0	0	1241084	0	0	0	0	0
ERO-EXP-5-4A	2012	Fall	EXP	ERO	5-4A	913848	1266720	0	0	0	0	0	2438436	0	0	0	0	0	0	512720	0	0	0	0	0	0	350610	0	0	2376608	252590	0	0	0	0	0	0	0	904800	0	0	0	1176240	0	0	0	0
ERO-EXP-5-4B	2012	Fall	EXP	ERO	5-4B	761540	1979250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1051830	0	0	0	0	0	0	0	2216760	0	0	0	0	0	0	0	588120	0	0	0	0
ERO-EXP-5-4C	2012	Fall	EXP	ERO	5-4C	1066156	4011280	0	0	0	0	0	1219218	0	0	0	0	0	1016392	512720	0	0	0	0	0	0	701220	0	0	594152	252590	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0	199056	0
ERO-EXP-5-5A	2012	Fall	EXP	ERO	5-5A	228462	237510	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	83694	0	0	0	350610	0	0	0	0	0	0	0	0	0	910832	0	0	1115920	0	1241084	12938640	0	0	0	0
ERO-EXP-5-5B	2012	Fall	EXP	ERO	5-5B	228462	237510	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5293080	0	0	0	0
ERO-EXP-5-5C	2012	Fall	EXP	ERO	5-5C	76154	263900	0	0	0	0	0	1219218	0	0	0	0	0	0	512720	0	0	334776	181714	0	0	0	0	0	594152	0	0	0	0	0	0	227708	0	0	0	0	0	4704960	0	0	0	0
ERO-REF-1-1A	2012	Fall	REF	ERO	1-1A	304616	765310	0	0	0	71630	0	0	369460	0	0	0	0	1524588	512720	0	0	83694	181714	0	0	350610	0	0	1188304	0	0	0	0	1108380	0	227708	0	0	557960	0	0	4116840	271440	0	0	0
ERO-REF-1-1B	2012	Fall	REF	ERO	1-1B	152308	606970	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	167388	181714	0	0	0	0	0	0	252590	0	0	0	0	0	455416	0	0	2789800	0	0	8821800	542880	0	0	0
ERO-REF-1-1C	2012	Fall	REF	ERO	1-1C	304616	844480	0	1151358	0	0	0	0	0	0	0	0	0	2032784	0	0	0	418470	0	0	0	0	0	0	0	757770	0	0	0	1108380	0	0	0	2262000	2789800	0	1241084	8233680	1628640	0	0	0
ERO-REF-1-2A	2012	Fall	REF	ERO	1-2A	152308	211120	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	167388	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19407960	2985840	0	0	0
ERO-REF-1-2B	2012	Fall	REF	ERO	1-2B	228462	369460	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21172320	2714400	0	0	0
ERO-REF-1-2C	2012	Fall	REF	ERO	1-2C	0	606970	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	251082	0	0	0	350610	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	25877280	2171520	0	0	0
ERO-REF-1-3A	2012	Fall	REF	ERO	1-3A	533078	738920	0	0	0	0	0	0	369460	0	0	0	0	1016392	1538160	0	0	167388	0	0	0	350610	0	0	1188304	0	0	0	0	0	0	227708	0	0	6137560	0	0	10586160	271440	0	0	0
ERO-REF-1-3B	2012	Fall	REF	ERO	1-3B	304616	606970	0	0	0	0	0	0	0	0	0	0	0	508196	1538160	0	0	251082	0	0	0	0	0	0	594152	0	0	0	0	0	0	227708	0	0	0	0	0	13526760	1085760	0	0	0
ERO-REF-1-3C	2012	Fall	REF	ERO	1-3C	304616	870870	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18819840	814320	0	0	0
ERO-REF-1-4A	2012	Fall	REF	ERO	1-4A	380770	712530	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	0	334776	0	0	0	4207320	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	4704960	0	0	0	0
ERO-REF-1-4B	2012	Fall	REF	ERO	1-4B	380770	765310	0	383786	0	0	0	0	0	0	0	0	0	0	1538160	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	1108380	0	0	0	1809600	0	0	0	2940600	0	0	0	0
ERO-REF-1-4C	2012	Fall	REF	ERO	1-4C	1294618	1134770	0	383786	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3528720	0	0	0	0
ERO-REF-1-5A	2012	Fall	REF	ERO	1-5A	152308	184730	0	0	0	0	0	0	0	0	0	0	1909882	508196	1538160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8595600	0	0	1241084	11174280	542880	0	0	0
ERO-REF-1-5B	2012	Fall	REF	ERO	1-5B	0	422240	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	334776	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	0	23524800	1628640	0	0	0
ERO-REF-1-5C	2012	Fall	REF	ERO	1-5C	0	263900	0	383786	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	227708	0	904800	0	0	0	18231720	1085760	0	0	0

Periphyton: Live

ECO_ID	P043	P044	P045	P046	P047	P048	P049	P050	P051	P052	P053	P054	P055	P056	P057	P058	P059	P060	P061	P062	P063	P064	P065	P066	P067	P068	P069	P070	P071	P072	P073	P074	P075	P076	P077	P078	P079	P080	P081	P082	P083	P084	P085	P086	P087	P088	P089	P090	P091
DEP-EXP-1-1	0	1833728	0	0	2230332	0	0	0	0	0	241280	0	0	1007344	2262000	0	0	0	0	0	0	4818060	0	0	0	0	0	1404702	0	6876480	0	2651064	0	0	0	13911300	995280	81432	51272	165880	0	0	0	0	0	0	0	0	0
DEP-EXP-1-2	0	916864	0	0	7062718	0	0	0	0	0	965120	0	0	2014688	11310000	0	0	0	0	0	0	2623166	0	0	0	0	861068	2809404	0	2292160	12825540	3976596	0	0	0	47298420	0	176436	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-3	0	1833728	0	0	4088942	0	0	0	0	0	603200	0	0	3777540	0	0	0	0	0	0	0	3854448	0	0	0	0	0	1404702	0	2292160	8550360	2651064	0	0	0	19475820	0	95004	76908	165880	0	0	0	0	0	0	0	0	0
DEP-EXP-2-1	0	916864	0	0	3345498	0	0	0	0	0	1930240	0	0	7303244	4524000	0	0	0	0	0	0	1284816	0	0	251836	0	0	1872936	0	0	0	2209220	0	0	0	8346780	0	13572	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-2	0	0	0	0	11523382	0	0	0	0	0	1568320	0	0	6044064	2262000	0	0	0	0	0	0	3319108	0	0	0	0	0	1404702	0	0	8550360	6185816	0	0	0	16693560	0	40716	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-3	0	916864	0	0	6690996	0	0	0	0	0	965120	0	0	7051408	2262000	0	0	0	0	0	0	1338350	0	0	251836	0	0	1404702	0	0	0	4418440	0	0	0	27822600	0	27144	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-1	0	0	0	0	4460664	0	0	0	0	0	844480	0	0	5540392	13572000	0	0	0	0	0	0	1980758	0	0	251836	0	0	2341170	0	0	0	4860284	13232700	0	0	22258080	0	27144	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-2	0	1833728	377000	1631656	4832386	0	0	0	0	0	1206400	0	0	4029376	2262000	0	0	0	0	0	0	1927224	0	0	0	0	0	5150574	0	0	8550360	10162412	0	0	0	5564520	0	54288	0	0	0	0	597168	0	0	0	0	0	0
DEP-EXP-3-3	0	1833728	0	3671226	3717220	0	0	0	0	0	1930240	0	0	2266524	0	0	0	0	0	0	0	1766622	0	0	0	0	0	2341170	0	0	0	4860284	0	0	0	22258080	0	13572	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-1	0	3667456	0	0	3345498	0	0	0	0	0	482560	0	0	2014688	0	0	0	0	0	0	0	4657458	0	0	0	0	0	2341170	0	0	0	2209220	0	0	0	11129040	0	54288	0	0	0	0	0	0	0	0	211120	0	0
DEP-EXP-4-2	0	1833728	0	0	5575830	0	0	0	0	0	603200	0	0	1259180	0	0	0	0	0	0	0	1338350	0	0	0	0	0	8896446	0	0	4275180	6185816	4410900	0	0	8346780	0	13572	0	165880	36192	0	0	0	0	0	422240	0	0
DEP-EXP-4-3	0	0	0	0	3345498	0	0	0	0	0	603200	0	0	1259180	0	0	0	0	0	0	0	1713088	0	0	0	0	0	2341170	0	0	0	883688	0	0	0	22258080	0	13572	0	165880	36192	38454	0	0	0	0	211120	0	0
DEP-EXP-5-1	0	0	0	0	1486888	0	0	0	0	0	241280	0	0	1511016	0	0	0	0	0	0	0	1445418	0	0	0	0	861068	3745872	0	0	4275180	4418440	0	0	0	5564520	0	54288	0	82940	0	76908	0	0	0	0	0	0	0
DEP-EXP-5-2	0	0	0	0	4088942	0	0	0	0	0	603200	0	0	2266524	0	0	0	0	0	0	0	1552486	0	0	0	0	0	6087042	0	0	29926260	6185816	0	0	0	11129040	0	13572	0	0	0	38454	597168	0	0	0	0	0	0
DEP-EXP-5-3	0	0	0	0	185861	0	0	0	0	0	542880	0	0	1133262	1131000	0	0	0	0	0	0	1204515	0	0	0	0	0	702351	0	0	2137590	5081206	0	0	0	12520170	0	6786	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-1	0	0	0	0	3345498	0	0	0	0	0	0	0	0	503672	2262000	0	0	0	0	0	0	214136	0	0	0	0	0	936468	0	0	4275180	0	0	0	0	2782260	0	162864	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-2	0	0	0	0	3345498	0	0	0	0	0	0	0	0	503672	2262000	0	0	0	0	0	0	0	0	0	251836	0	0	468234	0	0	0	0	0	0	0	13911300	0	135720	0	82940	72384	0	0	0	0	0	0	0	0
DEP-EXP-6-3	0	0	0	0	371722	0	0	0	0	0	361920	0	0	1259180	2262000	0	0	0	0	0	0	107068	0	0	0	0	0	936468	0	0	0	1325532	0	0	0	0	0	108576	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-1	0	0	0	0	2602054	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	160602	0	0	0	0	0	936468	0	0	4275180	441844	0	0	0	0	0	67860	0	0	0	38454	0	0	0	0	0	0	0
DEP-EXP-7-2	0	0	0	0	2602054	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	107068	0	0	0	0	0	936468	0	0	0	441844	0	0	0	0	0	54288	0	0	0	38454	0	0	0	0	0	0	0
DEP-EXP-7-3	0	0	0	407914	0	0	0	0	0	0	361920	0	0	251836	0	0	0	0	0	0	0	642408	0	0	0	0	0	0	0	0	0	0	0	0	0	11129040	0	67860	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-1	0	1833728	0	815828	1858610	0	0	0	0	0	241280	0	0	755508	2262000	0	0	0	0	0	0	803010	0	0	0	0	0	2809404	0	0	0	0	0	0	0	19475820	0	40716	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-2	0	916864	0	1631656	3345498	0	0	0	0	0	241280	0	0	1007344	2262000	0	0	0	0	0	0	803010	0	0	0	0	0	468234	0	0	4275180	1325532	0	0	0	27822600	0	40716	25636	0	72384	0	0	0	0	0	0	0	0
DEP-REF-1-3	0	916864	0	407914	5575830	0	0	0	0	0	241280	0	0	1007344	0	0	0	0	0	0	0	1124214	0	0	0	0	0	0	0	2292160	0	0	0	0	0	44516160	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-1	0	0	0	407914	2230332	0	2961712	0	0	0	120640	0	0	503672	2262000	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	441844	0	0	0	8346780	995280	27144	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-2	0	3667456	0	2447484	5575830	0	11846848	0	0	0	1085760	0	0	1762852	2262000	0	0	0	0	0	0	374738	0	0	0	0	0	936468	0	0	0	1767376	0	0	0	0	0	40716	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-3	0	0	0	407914	3345498	0	14808560	0	0	0	361920	0	0	1762852	0	0	0	0	0	0	0	910078	0	0	0	0	0	1872936	0	0	0	0	0	0	0	5564520	995280	27144	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-1	444860	0	0	407914	1115166	0	0	0	0	0	241280	0	0	2770196	0	0	0	0	0	0	0	1177748	0	0	0	0	0	1404702	0	0	0	883688	0	0	0	44516160	0	40716	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-2	889720	0	0	815828	0	0	0	0	0	0	120640	0	0	755508	2262000	0	0	0	0	0	0	1391884	0	0	0	0	0	0	0	0	0	441844	0	0	0	16693560	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-3	0	0	0	815828	0	0	0	0	0	0	723840	0	0	1007344	0	0	0	0	0	0	0	107068	0	0	0	0	0	0	0	0	4275180	2209220	0	0	0	11129040	0	13572	0	0	36192	0	0	0	0	0	0	0	0
ERO-EXP-1-1A	0	0	0	0	2230332	0	0	0	0	0	241280	0	0	0	2262000	0	0	0	0	0	0	535340	0	0	0	0	0	2809404	0	0	0	883688	0	0	0	8346780	0	149292	0	248820	687648	0	0	0	0	0	0	0	0
ERO-EXP-1-1B	0	0	0	1223742	2602054	0	0	0	0	0	241280	0	0	251836	2262000	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	2651064	0	0	0	2782260	0	81432	0	0	72384	0	1194336	0	0	0	0	0	0
ERO-EXP-1-1C	0	916864	0	815828	1486888	0	0	0	0	0	241280	0	0	0	0	0	0	0	0	0	0	642408	0	0	0	0	0	0	0	0	0	1325532	0	0	0	2782260	0	230724	0	0	0	115362	0	0	0	0	0	0	0
ERO-EXP-1-2A	0	0	0	407914	743444	0	0	0	0	0	241280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	883688	0	0	0	13911300	0	190008	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-2B	0	0	0	815828	1115166	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	107068	0	0	0	0	0	468234	0	0	0	441844	0	0	0	0	0	108576	25636	82940	144768	0	0	0	0	0	1477840	0	0
ERO-EXP-1-2C	0	916864	0	0	1858610	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	53534	0	0	0	0	0	936468	0	0	4275180	441844	0	0	0	5564520	0	122148	0	165880	180960	0	0	0	0	0	211120	0	0
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ERO-EXP-2-1A	0	0	0	0	1115166	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	4418440	0	0	0	11129040	0	27144	25636	663520	977184	0	1791504	0	0	0	0	0	0
ERO-EXP-2-1B	0	0	0	0	2602054	0	0	0	0	0	361920	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	3976596	0	0	0	0	5971680	190008	102544	165880	217152	0	2388672	0	0	0	0	0	0
ERO-EXP-2-1C	0	0	0	0	2973776	0	0	0	0	0	361920	0	0	503672	0	0	0	0	0	0	0	53534	0	0	0	0	0	468234	0	0	0	2209220	0	0	0	2782260	0	54288	0	82940	1990560	38454	0	0	0	0	0	0	0
ERO-EXP-2-2A	0	0	0	0	0	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	107068	0	0	0	0	0	1404702	0	0	8550360	0	0	0	0	0	1990560	40716	76908	0	180960	38454	0	0	0	0	0	0	0
ERO-EXP-2-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	0	0	0	0	0	995280	40716	128180	1824680	615264	0	4777344	0	0	0	0	0	0
ERO-EXP-2-2C	0	0	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	861068	0	0	0	0	0	0	0	0	0	0	312156	0	248820	977184	38454	2388672	0	0	0	0	0	0
ERO-EXP-2-3A	0	0	0	0	2602054	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1404702	0	0	0	0	0	0	0	0	0	122148	0	0	0	38454	597168	0	0	0	0	0	0
ERO-EXP-2-3B	0	0	0	0	1486888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	719316	0	0	72384	0	0	0	0	0	0	0	0
ERO-EXP-2-3C	0	916864	0	0	1486888	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	0	0	0	0	0	0	285012	0	0	36192	0	0	0	0	0	0	0	0
ERO-EXP-2-4A	0	916864	0	0	1858610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3277638	0	0	0	883688	0	0	0	0	0	135720	0	0	1302912	0	0	0	0	0	0	0	0
ERO-EXP-2-4B	0	916864	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	441844	0	0	0	5564520	0	95004	25636	0	72384	0	0	0	0	0	0	0	0
ERO-EXP-2-4C	0	916864	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2209220	0	0	0	2782260	0	95004	0	0	542880	0	0	0	0	0	0	0	0
ERO-EXP-2-5A	0	0	0	0	3345498	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	861068	1404702	0	0	0	1325532	0	0	0	0	0	81432	0	0	0	76908	0	0	0	0	0	0	0
ERO-EXP-2-5B	0	0	0	0	1858610	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	1404702	0	0	0	2209220	0	0	0	2782260	0	54288	0	0	180960	38454	0	0	0	0	0	0	0
ERO-EXP-2-5C	0	0	0	0	743444	0	0	0	0	0	0	0	0	503672	2262000	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	2651064	0	0	0	5564520	0	81432	0	0	108576	0	0	0	0	0	0	0	0
ERO-EXP-3-1A	0	0	0	0	2230332	0	0	0	0	0	482560	0	0	755508	0	0	0	0	0	0	0	160602	0	0	0	0	0	936468	0	4584320	0	3976596	0	0	0	11129040	0	95004	0	0	0	38454	0	0	0	0	0	0	0
ERO-EXP-3-1B	0	0	0	0	2602054	0	0	0	0	0	0	0	0	1007344	0	0	0	0	0	0	0	267670	0	0	0	0	0	1404702	0	0	0	1325532	0	0	0	8346780	0	40716	0	0	36192	0	0	0	0	0	0	0	0
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ERO-EXP-3-2B	0	0	0	0	1115166	0	0	0	0	0	482560	0	0	503672	0	0	0	0	0	0	0	428272	0	0	0	0	0	13578786	0	6876480	0	3092908	0	0	0	5564520	0	40716	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2C	0	0	0	0	2973776	0	0	0	0	0	241280	0	0	251836	0	0	0	0	0	0	0	374738	0	0	0	0	0	936468	0	0	4275180	0	0	0	0	19475820	0	13572	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-3-3C	0	0	0	0	1115166	0	0	0	0	0	120640	0	0	755508	0	0	0	0	0	0	0	0	0	398112	0	0	0	6087042	0	0	0	7069504	0	0	0	8346780	0	54288	0	0	470496	38454	0	0	0	0	0	0	0
ERO-EXP-3-4A	0	0	0	0	743444	0	0	0	0	0	0	0	0	1259180	0	0	0	0	0	0	0	0	0	0	0	0	0	1872936	0	0	8550360	5743972	0	0	0	0	0	95004	0	0	108576	0	0	0	0	0	0	0	0
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ERO-EXP-3-4C	0	0	0	0	1858610	0	0	0	0	0	1085760	0	0	755508	0	0	0	0	0	0	0	535340	0	0	0	0	0	468234	0	0	8550360	9720568	0	0	0	5564520	1990560	95004	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5A	0	0	0	0	743444	0	0	0	0	0	0	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	17100720	4418440	0	0	0	5564520	0	81432	25636	82940	144768	38454	0	0	0	0	0	0	0
ERO-EXP-3-5B	0	0	0	0	371722	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	1404702	0	0	4275180	1767376	0	0	0	8346780	0	135720	25636	0	180960	0	0	0	0	0	0	0	0
ERO-EXP-3-5C	0	0	0	0	1858610	0	0	0	0	0	241280	0	0	503672	0	0	0	0	0	0	0	695942	0	0	0	0	0	7023510	0	0	4275180	2651064	0	0	0	8346780	0	81432	51272	0	144768	0	0	0	0	0	0	0	0
ERO-EXP-4-1A	0	0	0	0	1115166	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	107068	0	0	0	0	0	2809404	0	0	0	2651064	0	0	0	5564520	0	135720	76908	0	72384	0	0	0	0	0	0	0	0
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ERO-EXP-4-1C	0	916864	0	0	1858610	0	0	0	0	0	241280	0	0	755508	0	0	0	0	0	0	0	267670	0	0	0	0	0	1404702	0	0	0	2651064	0	0	0	8346780	0	108576	25636	0	398112	38454	0	0	0	0	0	0	0
ERO-EXP-4-2A	0	0	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7959978	0	0	8550360	3976596	0	0	0	8346780	0	67860	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-2B	0	0	0	0	371722	0	0	0	0	0	241280	0	0	251836	0	0	0	4896476	0	0	0	107068	0	0	0	0	0	936468	0	0	0	3092908	0	0	0	0	0	27144	25636	0	36192	0	0	0	0	0	0	0	0
ERO-EXP-4-2C	0	0	0	0	743444	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	1325532	0	0	0	2782260	0	40716	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3A	0	916864	0	0	0	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2341170	0	0	0	2209220	0	0	0	2782260	0	67860	0	0	180960	0	0	0	0	0	0	0	0
ERO-EXP-4-3B	0	0	0	0	743444	0	0	0	0	0	0	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	1325532	0	0	0	0	0	40716	0	0	36192	0	0	0	0	0	0	0	0
ERO-EXP-4-3C	0	0	0	0	0	0	0	0	0	0	241280	0	0	0	0	0	0	0	0	0	0	107068	0	0	0	0	0	936468	0	0	0	1767376	0	0	0	2782260	0	3501576	0	0	36192	0	0	0	0	0	0	0	0
ERO-EXP-4-4A	0	0	0	0	1858610	0	0	0	0	0	241280	0	0	755508	0	0	0	0	0	0	0	53534	0	0	0	0	0	2809404	0	0	0	2209220	0	0	0	5564520	0	176436	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-4B	0	0	0	0	371722	0	0	0	0	0	120640	0	0	1007344	0	0	0	0	0	0	0	803010	0	0	0	0	0	468234	0	0	0	1767376	0	0	0	11129040	0	81432	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-4C	0	0	0	0	1486888	0	0	0	0	0	241280	0	0	1762852	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	5743972	0	0	0	0	0	380016	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5A	0	0	0	0	743444	0	0	0	0	0	0	0	0	503672	0	0	0	0	0	0	0	107068	0	0	0	0	0	936468	0	0	0	1767376	0	0	0	2782260	0	162864	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5B	0	0	0	0	371722	0	0	0	0	0	361920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1325532	0	0	0	8346780	0	108576	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5C	0	6418048	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53534	0	0	0	0	0	936468	0	4584320	0	1767376	0	0	0	2782260	0	67860	0	0	0	0	597168	0	0	0	0	0	0
ERO-EXP-5-1A	0	916864	0	0	1858610	0	0	0	0	0	120640	0	0	251836	4524000	0	0	0	0	0	0	1070680	0	0	0	0	0	468234	0	0	0	0	0	0	0	2782260	0	54288	0	0	0	38454	0	0	0	0	0	376246	0
ERO-EXP-5-1B	0	916864	0	0	1486888	0	2961712	0	0	0	241280	0	0	0	2262000	0	0	0	0	0	0	588874	0	398112	0	0	0	468234	0	0	0	0	0	0	0	5564520	0	13572	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-1C	0	0	0	0	1858610	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	481806	0	0	0	0	0	0	0	0	0	441844	0	0	0	5564520	0	27144	0	0	0	38454	0	0	0	0	0	0	0

Periphyton: Live

ECO_ID	P043	P044	P045	P046	P047	P048	P049	P050	P051	P052	P053	P054	P055	P056	P057	P058	P059	P060	P061	P062	P063	P064	P065	P066	P067	P068	P069	P070	P071	P072	P073	P074	P075	P076	P077	P078	P079	P080	P081	P082	P083	P084	P085	P086	P087	P088	P089	P090	P091
ERO-EXP-5-2A	0	0	0	0	2973776	0	0	0	0	0	482560	0	0	1511016	2262000	0	0	0	0	0	0	695942	0	0	0	0	0	5618808	0	0	4275180	10162412	0	0	0	22258080	0	40716	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-2B	0	0	0	0	3345498	0	0	0	0	0	965120	0	0	2518360	2262000	0	0	0	0	0	0	1070680	0	0	0	0	0	5618808	0	0	0	7953192	0	0	0	38951640	0	54288	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-2C	0	916864	0	0	9293050	0	0	0	0	0	844480	0	0	4784884	0	0	0	0	0	0	0	1498952	0	0	0	0	0	7023510	0	0	8550360	6185816	0	0	0	5564520	0	190008	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-3A	0	0	0	0	1858610	0	0	0	0	0	603200	0	0	755508	2262000	0	0	0	0	0	0	0	0	0	0	0	0	2809404	0	0	12825540	1325532	0	0	0	2782260	0	149292	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-3B	0	0	0	0	1115166	0	0	0	0	0	241280	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21375900	883688	0	0	0	0	0	67860	0	0	36192	76908	0	0	0	0	0	0	0
ERO-EXP-5-3C	0	0	0	0	371722	0	0	0	0	0	0	0	0	1259180	0	0	0	0	0	0	0	0	0	0	0	0	0	3745872	0	0	4275180	2651064	0	0	0	0	0	81432	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4A	0	0	0	0	743444	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	1404702	0	0	4275180	441844	0	0	0	2782260	0	95004	0	331760	0	0	0	0	0	0	0	0	0
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ERO-EXP-5-5A	0	0	0	0	371722	0	0	0	0	0	241280	0	0	0	0	0	0	0	0	0	0	910078	0	0	0	0	0	0	0	0	0	441844	0	0	0	5564520	0	13572	25636	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	1990560	27144	76908	0	0	76908	0	0	0	0	0	0	0
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ERO-REF-1-1A	0	916864	0	1631656	1115166	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	695942	0	0	0	0	0	468234	0	0	0	1325532	0	0	0	0	0	203580	51272	0	0	38454	0	0	0	0	0	0	0
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ERO-REF-1-1C	0	0	0	0	6690996	0	0	0	0	0	361920	0	0	1007344	0	0	0	0	0	0	0	107068	0	398112	0	0	0	1872936	0	0	4275180	9720568	0	0	0	11129040	0	108576	51272	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2A	0	916864	0	0	0	0	0	0	0	0	120640	0	0	755508	0	0	0	0	0	0	0	107068	0	0	0	0	0	0	0	0	0	441844	0	0	0	5564520	0	190008	25636	0	0	153816	0	0	0	0	0	0	0
ERO-REF-1-2B	0	1833728	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	214136	0	0	0	0	0	468234	0	0	0	0	0	0	0	0	0	162864	25636	0	108576	0	0	0	0	0	0	0	0
ERO-REF-1-2C	0	2750592	0	0	0	0	0	0	0	0	361920	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441844	0	0	0	8346780	0	203580	102544	0	108576	76908	0	0	0	0	0	0	0
ERO-REF-1-3A	0	916864	0	0	743444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	4275180	1325532	0	0	0	8346780	0	203580	0	0	0	76908	0	0	0	0	0	0	0
ERO-REF-1-3B	0	916864	0	0	0	0	0	0	0	0	0	0	0	0	2262000	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	4275180	441844	0	0	0	5564520	0	149292	0	0	0	38454	2985840	0	0	0	0	0	0
ERO-REF-1-3C	0	0	0	0	1115166	0	0	0	0	0	120640	0	0	0	4524000	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	4275180	0	0	0	0	5564520	0	95004	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4A	0	0	0	0	3717220	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	695942	0	0	0	0	0	1872936	0	0	0	441844	0	0	0	5564520	0	230724	76908	248820	0	38454	0	0	0	0	211120	0	0
ERO-REF-1-4B	0	0	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	374738	0	0	0	0	0	1872936	0	0	0	0	0	0	0	13911300	0	95004	25636	0	0	38454	0	0	0	0	0	0	0
ERO-REF-1-4C	0	0	0	0	1858610	0	0	0	0	0	482560	0	0	755508	0	0	0	0	0	0	0	428272	0	0	0	0	0	3745872	0	0	0	441844	0	0	0	5564520	0	298584	0	248820	0	38454	0	0	0	0	0	0	0
ERO-REF-1-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8346780	0	27144	25636	0	0	76908	1194336	0	0	0	0	0	0
ERO-REF-1-5B	0	1833728	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441844	0	0	0	0	0	0	0	0	36192	0	1791504	0	0	0	0	0	0
ERO-REF-1-5C	0	0	0	0	0	0	0	0	0	0	361920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	2651064	4410900	0	0	0	0	81432	51272	0	72384	38454	0	0	0	0	0	0	0

Periphyton: Live

ECO_ID	P092	P093	P094	P095	P096	P097	P098	P099	P100	P101	P102	P103	P104	P105	P106	P107	P108	P109	P110	P111	P112	P113	P114	P115	P116	P117	P118	P119	P120	P121	P122	P123	P124	P125	P126	P127	P128	P129	P130	P131	P132	P133	P134	P135	P136	P137	P138	P139	P140	P141	P142	P143
DEP-EXP-1-1	0	0	0	42224	0	0	0	0	0	0	16588	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	0	0
DEP-EXP-1-2	0	0	0	15080	0	0	0	0	0	0	15080	0	0	0	0	217152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	678600	0	0
DEP-EXP-1-3	0	0	0	0	0	0	0	0	0	0	15080	0	0	0	0	190008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150800	0	0
DEP-EXP-2-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	0	0
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DEP-EXP-4-1	0	0	177944	0	0	0	0	0	0	33930	0	0	0	0	0	384540	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2225808	0	0	0	4524000	0	0	0	0	0	0
DEP-EXP-4-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	248820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-3	0	0	36192	0	0	0	0	0	0	0	11310	0	0	0	0	366444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	312156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-EXP-7-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150800	0	0
DEP-EXP-7-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	0	0
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DEP-REF-3-3	0	0	0	30160	0	0	0	0	0	0	0	0	0	0	0	36192	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150800	0	0
ERO-EXP-1-1A	0	0	0	6032	0	0	0	0	0	0	118378	0	0	0	0	144768	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	127524020	0	0	0	0	0	0	3581500	0	0	0	0	0	150800	0	0
ERO-EXP-1-1B	0	0	0	6032	0	0	0	0	0	0	7540	0	0	0	0	104052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	301600	0	0
ERO-EXP-1-1C	0	0	0	0	0	0	0	0	0	0	11310	0	0	0	0	95004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13733356	0	0	0	0	0	0	1432600	0	0	0	0	0	527800	0	0
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ERO-EXP-1-4A	0	0	0	15080	0	0	0	0	0	0	37700	0	0	0	0	99528	0	0	0	0	0	0	75400	0	5051800	0	0	0	0	0	0	0	0	0	0	0	23542896	0	0	0	0	0	0	1432600	0	0	0	0	0	75400	0	0
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ERO-EXP-1-5A	0	0	0	15080	0	0	0	0	0	0	67860	0	0	0	0	58812	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89386700	0	0	0	0	0	2148900	0	0	0	0	0	527800	0	0
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ERO-EXP-2-1A	0	0	0	0	0	0	0	0	0	0	67106	0	0	54288	0	366444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2148900	0	0	0	10228764	0	0	0	0
ERO-EXP-2-1B	0	0	0	60320	0	0	0	0	0	0	10556	0	0	135720	0	420732	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7844616	0	0	0	0
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ERO-EXP-2-3A	0	0	0	0	0	0	0	0	0	0	22620	0	0	13572	0	606216	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6665360	0	0	0	0
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ERO-EXP-4-5B	11310000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	716300	0	0	0	0	0	0	0	0
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ERO-EXP-5-1B	0	0	0	0	0	0	0	0	0	0	11310	0	0	0	0	85956	0	2157194	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5885724	0	0	0	0	0	0	0	0	0	0	0	0	377000	0	0
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Periphyton: Live

ECO_ID	P092	P093	P094	P095	P096	P097	P098	P099	P100	P101	P102	P103	P104	P105	P106	P107	P108	P109	P110	P111	P112	P113	P114	P115	P116	P117	P118	P119	P120	P121	P122	P123	P124	P125	P126	P127	P128	P129	P130	P131	P132	P133	P134	P135	P136	P137	P138	P139	P140	P141	P142	P143
ERO-EXP-5-2A	0	0	0	0	0	0	0	0	0	0	26390	0	0	0	0	104052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22258080	0	2865200	0	0	0	0	0	377000	0	0
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ERO-REF-1-1C	0	0	18096	39208	0	0	0	0	0	0	0	0	0	0	0	343824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35754680	0	241280	0	0	0	49424700	0	0	10631400	0	0	0	0	0
ERO-REF-1-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	217152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226200	0	0
ERO-REF-1-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	226200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	527800	0	0
ERO-REF-1-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	307632	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	527800	0	0
ERO-REF-1-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	325728	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15042300	0	0	0	0	0	226200	0	0
ERO-REF-1-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	266916	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9311900	0	0	0	0	0	226200	0	0
ERO-REF-1-3C	0	0	0	0	0	0	0	0	0	56550	0	0	0	271440	0	343824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1432600	0	0	0	0	0	301600	0	0
ERO-REF-1-4A	0	0	0	0	0	0	0	0	0	0	7540	0	0	0	0	104052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2865200	0	0	0	0	0	75400	0	0
ERO-REF-1-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180960	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4C	0	0	0	0	0	0	0	0	0	0	18850	0	0	0	0	285012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10744500	0	0	0	0	0	150800	0	0
ERO-REF-1-5A	0	0	0	75400	0	0	0	0	0	0	0	0	0	0	0	185484	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38680200	0	0	0	0	0	75400	0	0
ERO-REF-1-5B	0	0	0	0	0	0	0	0	0	0	15080	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8595600	0	0	0	0	0	226200	0	0
ERO-REF-1-5C	0	0	0	60320	0	0	0	0	0	0	75400	0	0	0	0	307632	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19619080	0	0	0	0	0	0	17907500	0	0	0	2640508	0	150800	0	0

Periphyton: Live

ECO_ID	P144	P145	P146	P147	P148	P149	P150	P151	P152	P153	P154	P155	P156	P157	P158	P159	P160	P161	P162	P163	P164	P165	P166	P167	P168	P169	P170	P171	P172	P173	P174	P175	P176	P177	P178	P179	P180	P181	P182	P183	P184	P185	P186	P187	P188	P189
DEP-EXP-1-1	0	0	0	0	0	0	0	416208	0	0	0	0	0	0	0	0	0	0	0	0	0	380016	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-2	0	1085760	0	0	0	0	0	2081040	0	0	0	8294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	940992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-3	0	135720	0	0	0	0	0	208104	0	0	0	0	75400	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-1	0	0	0	0	0	0	0	832416	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3293472	0	0	0	0	0	0	0	0	0	0	0	422240	0	0	0	0	677092
DEP-EXP-2-2	0	407160	0	0	0	0	0	416208	0	0	0	16588	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	940992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	677092
DEP-EXP-2-3	0	135720	0	0	0	0	0	624312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422240	0	0	0	0	0
DEP-EXP-3-1	0	271440	0	0	0	0	0	1040520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-2	0	407160	0	0	0	0	0	1040520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-3	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-1	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	773604	0
DEP-EXP-4-2	0	0	0	0	0	0	0	416208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16211	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-1	0	0	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1311960	0	0	0	0	940992	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-2	0	271440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	470496	0	0	0	0	0	687648	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-3	0	67860	0	0	0	0	0	1976988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	983970	0	0	0	0	823368	0	0	0	0	0	0	1244100	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-1	0	0	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251082	0	0	0	0
DEP-EXP-6-2	0	271440	0	0	0	0	0	416208	0	0	67860	12441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	0	502164	0	0	0	0
DEP-EXP-6-3	0	135720	0	0	0	0	0	416208	0	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
DEP-EXP-7-1	0	271440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-2	0	271440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-3	0	1085760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-1	0	271440	0	0	0	0	0	208104	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-2	0	135720	0	0	0	0	0	416208	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-3	0	0	0	0	0	0	0	416208	0	0	271440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-1	0	0	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	655980	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-2	0	407160	0	0	0	0	0	208104	327236	0	135720	0	0	0	0	0	158340	1091792	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-3	0	271440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-1	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-2	0	135720	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-3-3	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1A	0	542880	0	0	0	0	0	0	0	0	203580	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1B	0	542880	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1C	0	2171520	0	0	0	0	0	0	0	0	271440	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-2A	0	8143200	0	0	0	0	0	0	0	0	407160	12441	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-2B	0	1357200	0	0	0	0	0	0	0	0	407160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-2C	0	2035800	0	0	0	0	0	0	0	0	0	16588	0	0	0	0	0	0	0	0	0	0	0	0	121394	0	0	0	235248	0	0	0	0	0	0	0	0	0	723840	0	0	0	0	0	0	0
ERO-EXP-1-3A	0	542880	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-3B	0	1085760	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-3C	0	3257280	0	0	0	0	0	624312	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-4A	0	4207320	0	0	0	0	0	0	0	0	1221480	33176	150800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-4B	0	814320	0	0	0	0	0	416208	0	0	203580	0	377000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-4C	0	407160	0	0	0	0	0	0	0	0	67860	24882	0	0	0	0	0	0	0	0	0	380016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-5A	0	678600	0	0	0	0	0	0	0	0	67860	8294	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-5B	0	0	0	0	0	0	0	0	0	0	67860	0	75400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-5C	0	6378840	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1A	0	1221480	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	91234	126672	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1B	0	135720	0	0	0	0	0	0	0	0	0	0	226200	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1C	0	271440	0	0	0	0	0	0	0	0	0	0	75400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2A	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2C	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3A	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3B	0	135720	0	0	0	0	0	208104	0	0	0	0	75400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3C	0	135720	0	0	0	0	0	0	0	0	0	0	150800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4A	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	158340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4B	0	814320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5700240	0	0	0	0	126672	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4C	0	0	0	0	0	0	0	208104	0	0	9364680	0	0	0	0	0	791700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5A	0	135720	0	0	0	0	0	0	0	0	203580	0	0	0	0	0	5383560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5B	0	135720	0	0	0	0	0	208104	0	0	0	0	75400	0	0	0	2216760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5C	0	271440	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	2375100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-1A	0	407160	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	105560	0	0	0	0	0
ERO-EXP-3-1B	0	0	0	0	0	0	0	0	0	0	0	12441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	603200	0	0	0	0	0	0	0
ERO-EXP-3-1C	0	0	0	0	0	0	0	0	0	0	0	74646	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	211120	0	0	0	0	0
ERO-EXP-3-2A	0	407160	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2B	0	135720	0	0	0	0	0	0	0	0	135720	0	0	0	0	0	0	0	0	0	273702	380016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2C	0	0	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	91234	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	2488200	0	0	0	0	105560	0	0	0	0	0
ERO-EXP-3-3A	0	0	0	0	0	0	0	208104	0	0	67860	0	0	0	0	0	0	0	0	0	91234	380016	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211120	1004328	0	0	0	0
ERO-EXP-3-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422240	334776	0	0	0	0
ERO-EXP-3-3C	0	135720	0	0	0	0	0	624312	0	0	135720	20735	0	0	0	0	0	0	0	0	182468	633360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422240	669552	0	0	0	0
ERO-EXP-3-4A	0	542880	0	0	0	0	0	0	0	0	1832220	8294	0	0	0	0	0	136474	0	0	0	506688	0	0	0	0	0	0	0	0	0	0	0	0	1031472	0	0	0	0	0	316680	1339104	0	0	0	0
ERO-EXP-3-4B	0	1764360	0	0	0	0	0	0	0	0	135720	16588	75400	0	0	0	0	0	0	0	91234	380016	0	0	0	0	0	0	0	0	0	0	0	0	687648	0	0	0	0	0	316680	251082	0	0	0	0
ERO-EXP-3-4C	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	1375296	0	0	0	0	0	0	502164	0	0	0	0
ERO-EXP-3-5A	0	1900080	0	0	0	0	0	0	0	0	0	41470	0	0	0	0	0	0	0	0	91234	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5B	0	407160	0	0	0	0	0	0	0	0	135720	8294	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5C	0	407160	0	0	0	0	0	416208	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	343824	0	0	0	0	0	211120	0	0	0	0	0
ERO-EXP-4-1A	0	2171520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	459940	0	0	0	0	0	0	0	343824	0	0	0	0	0	105560	585858	0	0	0	0
ERO-EXP-4-1B	0	814320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	1375296	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-4-1C	0	950040	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	380016	0	0	0	0	0	0	0	0	0	0	0	0	1719120	0	0	0	0	0	0	920634	0	0	0	0
ERO-EXP-4-2A	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	253344	0	0	0	0	0	0	0	0	0	0	0	0	687648	0	0	0	0	0	0	334776	0	0	0	0
ERO-EXP-4-2B	0	0	0	0	0	0	0	208104	0	0	135720	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	105560	418470	0	0	0	0
ERO-EXP-4-2C	0	0	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	705744	0	0	0	0	0	343824	0	0	0	0	0	211120	920634	0	0	0	0
ERO-EXP-4-3A	0	271440	0	0	0	0	0	416208	0	0	4546620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211120	585858	0	0	0	0
ERO-EXP-4-3B	0	135720	0	0	0	0	0	0	0	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-4-3C	0	1628640	0	0	0	0	0	0	0	0	339300	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	585858	573040	0	0	0
ERO-EXP-4-4A	0	407160	0	0	0	0	0	0	0	0	4885920	0	0	0	0	0	0	0	0	0	0	633360	0	0	0	0	0	0	470496	0	0	0	0	0	343824	0	0	0	0	0	422240	1004328	0	0	0	0
ERO-EXP-4-4B	0	0	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	91234	126672	0	0	0	0	0	0	470496	0	0	0	0	0	0	0	0	0	0	0	316680	669552	0	0	0	0
ERO-EXP-4-4C	0	1764360	0	0	0	0	0	416208	0	0	1153620	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	1881984	0	0	0	0	0	0	0	0	0	0	0	422240	669552	0	0	0	0
ERO-EXP-4-5A	0	678600	0	0	0	0	0	208104	0	0	0	4147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	105560	418470	0	0	0	0
ERO-EXP-4-5B	0	1085760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	705744	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5C	0	0	0	0	0	0	0	0	0	0	339300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	251082	0	0	0	0
ERO-EXP-5-1A	0	271440	0	0	0	0	0	0	0	0	203580	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	316680	334776	0	0	0	0
ERO-EXP-5-1B	0	135720	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	316680	418470	0	0	0	0
ERO-EXP-5-1C	0	2714400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	669552	0	0	0	0

Periphyton: Live

ECO_ID	P144	P145	P146	P147	P148	P149	P150	P151	P152	P153	P154	P155	P156	P157	P158	P159	P160	P161	P162	P163	P164	P165	P166
ERO-EXP-5-2A	0	271440	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-2B	0	407160	0	0	0	0	0	0	0	0	271440	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-2C	0	1764360	0	0	0	0	0	416208	0	0	407160	0	0	0	0	0	0	0	0	0	0	253344	0
ERO-EXP-5-3A	0	271440	0	0	0	0	0	0	0	0	67860	8294	0	0	0	0	0	0	0	0	0	126672	0
ERO-EXP-5-3B	0	0	0	0	0	0	0	0	0	0	0	24882	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-3C	0	0	0	0	0	0	0	0	0	0	67860	829.4	0	0	0	0	0	0	0	0	0	126672	0
ERO-EXP-5-4A	0	4885920	0	0	0	0	0	0	0	0	407160	0	0	0	0	0	0	682370	0	0	0	126672	0
ERO-EXP-5-4B	0	271440	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4C	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0
ERO-EXP-5-5A	0	271440	0	0	0	0	0	0	0	0	0	0	75400	0	0	0	0	0	0	0	0	126672	0
ERO-EXP-5-5B	0	135720	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	126672	0
ERO-EXP-5-5C	0	135720	0	0	0	0	0	0	0	0	67860	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1A	0	678600	0	0	0	0	0	0	0	0	1357200	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1B	0	542880	0	0	0	0	0	0	0	0	339300	0	0	0	0	0	158340	0	0	0	0	0	0
ERO-REF-1-1C	0	407160	0	0	0	0	0	208104	0	0	678600	0	0	0	0	0	0	0	0	0	91234	0	12968.8
ERO-REF-1-2A	0	814320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	633360	0	0	0	0	0	0
ERO-REF-1-2B	0	271440	0	0	0	0	0	1040520	0	0	135720	0	0	0	0	0	158340	0	0	0	0	0	0
ERO-REF-1-2C	0	1900080	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3A	0	135720	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3B	0	0	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3C	0	135720	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4A	0	2442960	0	0	0	0	0	624312	0	0	882180	0	0	0	0	0	158340	682370	0	0	0	0	0
ERO-REF-1-4B	0	678600	0	0	0	0	0	1040520	0	0	475020	0	0	0	0	0	158340	272948	0	0	0	0	0
ERO-REF-1-4C	0	2171520	0	0	0	0	0	416208	0	0	203580	0	0	0	0	0	0	136474	0	0	0	126672	25937.6
ERO-REF-1-5A	0	0	0	0	0	0	0	208104	0	0	203580	0	0	0	0	0	633360	0	0	0	0	0	0
ERO-REF-1-5B	0	135720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5C	0	542880	0	0	0	0	0	208104	0	0	67860	16588	0	0	0	0	0	0	0	0	0	0	0

ECO_ID	P167	P168	P169	P170	P171	P172	P173	P174	P175	P176	P177	P178	P179	P180	P181	P182	P183	P184	P185	P186	P187	P188	P189
ERO-EXP-5-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	633360	920634	0	0	0	0
ERO-EXP-5-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422240	920634	0	0	0	0
ERO-EXP-5-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211120	1422798	0	0	0	0
ERO-EXP-5-3A	0	0	0	0	0	0	0	0	0	0	0	1375296	0	0	0	0	0	211120	167388	0	0	0	0
ERO-EXP-5-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	211120	83694	0	0	0	0
ERO-EXP-5-3C	0	0	0	0	0	0	0	0	0	0	0	343824	0	0	0	0	0	0	83694	0	227708	0	0
ERO-EXP-5-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	334776	0	0	0	0
ERO-EXP-5-4B	0	0	0	0	0	0	0	0	0	0	0	343824	0	0	0	0	0	0	251082	0	0	0	0
ERO-EXP-5-4C	0	0	0	0	0	0	0	0	0	0	0	343824	0	0	0	723840	0	0	418470	0	0	0	0
ERO-EXP-5-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4B	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	683124	0	0
ERO-REF-1-4C	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Periphyton: Dead Biovolume

ECO_ID	Year	Season	Reach	Site	Transect	P001	P002	P003	P004	P005	P006	P007	P008	P009	P010	P011	P012	P013	P014	P015	P016	P017	P018	P019	P020	P021	P022	P023	P024	P025	P026	P027	P028	P029	P030	P031	P032	P033	P034	P035	P036	P037	P038	P039	P040
DEP-EXP-1-1	2012	Fall	EXP	DEP	KO-1	76154	184730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	452400	557960	0	0	0	0	0
DEP-EXP-1-2	2012	Fall	EXP	DEP	KO-2	152308	369460	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	0	0	0	0	0	701220	0	0	0	0	0	0	0	3325140	0	0	0	904800	1673880	0	0	0	0	0
DEP-EXP-1-3	2012	Fall	EXP	DEP	KO-3	76154	316680	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-1	2012	Fall	EXP	DEP	MG-1	76154	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181714	0	0	350610	0	0	0	0	0	0	0	1108380	0	0	0	452400	557960	0	0	0	0	0
DEP-EXP-2-2	2012	Fall	EXP	DEP	MG-2	0	158340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251082	0	0	0	701220	0	0	0	0	0	0	0	3325140	0	0	0	1809600	557960	0	0	0	0	0
DEP-EXP-2-3	2012	Fall	EXP	DEP	MG-3	76154	52780	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3166800	0	0	0	0	0	0
DEP-EXP-3-1	2012	Fall	EXP	DEP	C-1	76154	105560	0	0	0	0	0	0	369460	0	0	0	0	508196	512720	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3166800	557960	0	0	0	0	0
DEP-EXP-3-2	2012	Fall	EXP	DEP	C-2	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2262000	0	0	2482168	0	0	0
DEP-EXP-3-3	2012	Fall	EXP	DEP	C-3	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	83694	181714	0	0	0	0	0	0	0	0	0	346840	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-1	2012	Fall	EXP	DEP	AB-1	0	211120	0	0	0	0	0	0	369460	0	0	0	0	0	1538160	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2482168	588120	0	0
DEP-EXP-4-2	2012	Fall	EXP	DEP	AB-2	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	557960	0	0	1176240	0	0
DEP-EXP-4-3	2012	Fall	EXP	DEP	AB-3	76154	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	0	1115920	0	4964336	0	0	0
DEP-EXP-5-1	2012	Fall	EXP	DEP	TR-1	152308	211120	0	0	0	0	0	0	0	0	0	0	0	0	1538160	0	0	334776	0	8016528	0	0	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-2	2012	Fall	EXP	DEP	TR-2	0	131950	0	0	0	0	0	0	0	0	0	0	0	0	2563600	0	0	167388	0	0	0	0	0	0	594152	757770	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-3	2012	Fall	EXP	DEP	TR-3	76154	171535	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	167388	0	4008264	0	0	0	0	0	0	0	0	0	554190	0	0	0	0	0	0	0	0	0	0
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DEP-EXP-6-2	2012	Fall	EXP	DEP	FS-2	0	52780	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	181714	2672176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	557960	0	0	588120	0	0
DEP-EXP-6-3	2012	Fall	EXP	DEP	FS-3	228462	131950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-1	2012	Fall	EXP	DEP	WA-1	0	52780	0	383786	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-2	2012	Fall	EXP	DEP	WA-2	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	167388	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-3	2012	Fall	EXP	DEP	WA-3	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-1	2012	Fall	REF	DEP	KE-1	0	79170	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	251082	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	452400	0	0	0	0	0	0
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DEP-REF-2-1	2012	Fall	REF	DEP	GE-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	452400	0	0	0	0	0	0
DEP-REF-2-2	2012	Fall	REF	DEP	GE-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251082	363428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-3	2012	Fall	REF	DEP	GE-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	1115920	0	0	0	0	0
DEP-REF-3-1	2012	Fall	REF	DEP	BB-1	0	52780	0	383786	0	0	0	0	0	0	0	0	0	508196	0	0	0	167388	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2262000	0	0	0	0	0	0
DEP-REF-3-2	2012	Fall	REF	DEP	BB-2	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	0	0	0
DEP-REF-3-3	2012	Fall	REF	DEP	BB-3	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	452400	0	0	0	0	0	0
ERO-EXP-1-1A	2012	Fall	EXP	ERO	1-1A	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-1-1B	2012	Fall	EXP	ERO	1-1B	76154	158340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	0	0	0	588120	0	0
ERO-EXP-1-1C	2012	Fall	EXP	ERO	1-1C	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	83694	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176240	0	0
ERO-EXP-1-2A	2012	Fall	EXP	ERO	1-2A	76154	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	346840	0	0	0	0	1809600	0	0	0	1176240	0	0
ERO-EXP-1-2B	2012	Fall	EXP	ERO	1-2B	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2352480	0	0
ERO-EXP-1-2C	2012	Fall	EXP	ERO	1-2C	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	363428	0	0	0	0	0	0	0	17648878	0	0	0	0	0	0	904800	0	0	0	588120	0	0
ERO-EXP-1-3A	2012	Fall	EXP	ERO	1-3A	304616	158340	0	383786	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0	0	0	594152	0	0	0	693680	0	0	0	0	452400	0	0	0	588120	0	0
ERO-EXP-1-3B	2012	Fall	EXP	ERO	1-3B	76154	79170	0	0	0	0	0	0	0	279734	0	0	0	0	0	0	0	0	0	0	0	350610	0	0	0	0	17648878	0	346840	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-1-3C	2012	Fall	EXP	ERO	1-3C	152308	131950	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	1241084	0	0	0
ERO-EXP-1-4A	2012	Fall	EXP	ERO	1-4A	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	83694	0	0	0	0	0	0	0	0	17648878	0	346840	0	0	0	0	452400	0	0	0	588120	0	0
ERO-EXP-1-4B	2012	Fall	EXP	ERO	1-4B	76154	79170	0	0	0	0	0	0	0	0	0	0	0	1016392	1025440	0	0	0	0	0	0	0	0	0	0	0	17648878	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-4C	2012	Fall	EXP	ERO	1-4C	152308	237510	0	0	0	0	0	0	0	0	0	0	0	1016392	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	346840	0	0	227708	0	0	0	0	0	588120	0	923650
ERO-EXP-1-5A	2012	Fall	EXP	ERO	1-5A	76154	158340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	0	0	0	0	0	0
ERO-EXP-1-5B	2012	Fall	EXP	ERO	1-5B	76154	131950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	0	0	0
ERO-EXP-1-5C	2012	Fall	EXP	ERO	1-5C	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1241084	0	0	0
ERO-EXP-2-1A	2012	Fall	EXP	ERO	2-1A	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1B	2012	Fall	EXP	ERO	2-1B	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-1C	2012	Fall	EXP	ERO	2-1C	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2A	2012	Fall	EXP	ERO	2-2A	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2B	2012	Fall	EXP	ERO	2-2B	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-2C	2012	Fall	EXP	ERO	2-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3A	2012	Fall	EXP	ERO	2-3A	0	211120	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2262000	0	0	0	0	0	0
ERO-EXP-2-3B	2012	Fall	EXP	ERO	2-3B	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-3C	2012	Fall	EXP	ERO	2-3C	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4A	2012	Fall	EXP	ERO	2-4A	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-4B	2012	Fall	EXP	ERO	2-4B	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1115920	0	0	0	0	0
ERO-EXP-2-4C	2012	Fall	EXP	ERO	2-4C	152308	79170	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5A	2012	Fall	EXP	ERO	2-5A	152308	131950	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5B	2012	Fall	EXP	ERO	2-5B	76154	131950	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5C	2012	Fall	EXP	ERO	2-5C	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-1A	2012	Fall	EXP	ERO	3-1A	76154	316680	0	383786	0	0	0	1219218	0	0	0	0	0	0	0	0	0	251082	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	1176240	0	0
ERO-EXP-3-1B	2012	Fall	EXP	ERO	3-1B	0	105560	0	0	0	0	0	0	369460	0	0	0	0	0	512720	0	0	83694	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	0	0	0
ERO-EXP-3-1C	2012	Fall	EXP	ERO	3-1C	152308	158340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	0	0	0	0
ERO-EXP-3-2A	2012	Fall	EXP	ERO	3-2A	0	105560	0	0	0	0	0	0	369460	0	0	0	0	0	0	0	0	83694	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	1764360	0	0
ERO-EXP-3-2B	2012	Fall	EXP	ERO	3-2B	76154	158340	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	167388	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2C	2012	Fall	EXP	ERO	3-2C	0	184730	0	0	0	0	0	0	369460	0	0	0	0	508196	0	0	0	167388	181714	0	0	0	0	0	0	0	17648878	0	0	0	0	227708	0	1357200	0	0	0	1176240	0	0
ERO-EXP-3-3A	2012	Fall	EXP	ERO	3-3A	76154	184730	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	350610	0	0	594152	0	0	0	0	0	0	0	0	2262000	0	0	0	0	0	0
ERO-EXP-3-3B	2012	Fall	EXP	ERO	3-3B	152308	184730	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-3-3C	2012	Fall	EXP	ERO	3-3C	152308	158340	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	181714	0	0	0	0	0	594152	0	0	0	0	0	0	0	0	452400	0	0	0	0	0	0
ERO-EXP-3-4A	2012	Fall	EXP	ERO	3-4A	533078	395850	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-3-4B	2012	Fall	EXP	ERO	3-4B	76154	237510	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-4C	2012	Fall	EXP	ERO	3-4C	228462	290290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	701220	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176240	0	0
ERO-EXP-3-5A	2012	Fall	EXP	ERO	3-5A	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	0	0	0
ERO-EXP-3-5B	2012	Fall	EXP	ERO	3-5B	76154	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5C	2012	Fall	EXP	ERO	3-5C	76154	211120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	2672176	0	1051830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-4-1A	2012	Fall	EXP	ERO	4-1A	76154	158340	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	0	0	0
ERO-EXP-4-1B	2012	Fall	EXP	ERO	4-1B	304616	316680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-1C	2012	Fall	EXP	ERO	4-1C	0	184730	0	0	0	0	0	0	369460	0	0	0	0	508196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	1764360	0	0
ERO-EXP-4-2A	2012	Fall	EXP	ERO	4-2A	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	346840	0	0	0	0	1357200	0	0	0	1176240	0	0
ERO-EXP-4-2B	2012	Fall	EXP	ERO	4-2B	0	184730	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Periphyton: Dead Biovolume

ECO_ID	Year	Season	Reach	Site	Transect	P001	P002	P003	P004	P005	P006	P007	P008	P009	P010	P011	P012	P013	P014	P015	P016	P017	P018	P019	P020	P021	P022	P023	P024	P025	P026	P027	P028	P029	P030	P031	P032	P033	P034	P035	P036	P037	P038	P039	P040
ERO-EXP-4-2C	2012	Fall	EXP	ERO	4-2C	0	131950	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3A	2012	Fall	EXP	ERO	4-3A	0	52780	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3B	2012	Fall	EXP	ERO	4-3B	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3C	2012	Fall	EXP	ERO	4-3C	0	79170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	346840	0	0	227708	0	0	1115920	0	0	0	0	0
ERO-EXP-4-4A	2012	Fall	EXP	ERO	4-4A	304616	290290	0	0	0	0	0	0	0	0	0	0	0	0	1025440	0	37700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1809600	0	0	0	0	0	0
ERO-EXP-4-4B	2012	Fall	EXP	ERO	4-4B	76154	184730	0	0	0	0	0	0	0	0	0	0	0	508196	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	588120	0	0
ERO-EXP-4-4C	2012	Fall	EXP	ERO	4-4C	76154	184730	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	2482168	0	0	0
ERO-EXP-4-5A	2012	Fall	EXP	ERO	4-5A	0	184730	0	0	0	0	0	0	0	0	0	0	0	1016392	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	0	588120	0	0
ERO-EXP-4-5B	2012	Fall	EXP	ERO	4-5B	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	0	0	0	0	1176240	0	0
ERO-EXP-4-5C	2012	Fall	EXP	ERO	4-5C	0	52780	0	0	0	0	0	1219218	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-1A	2012	Fall	EXP	ERO	5-1A	0	0	0	0	0	0	0	0	738920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	557960	0	0	1764360	0	0
ERO-EXP-5-1B	2012	Fall	EXP	ERO	5-1B	0	79170	0	0	0	0	0	0	738920	0	0	0	0	0	512720	0	0	0	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	0	0	0	2352480	0	0
ERO-EXP-5-1C	2012	Fall	EXP	ERO	5-1C	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	181714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176240	0	0
ERO-EXP-5-2A	2012	Fall	EXP	ERO	5-2A	380770	211120	0	0	0	0	0	1219218	0	0	0	0	0	0	1025440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-2B	2012	Fall	EXP	ERO	5-2B	228462	290290	0	0	0	0	0	1219218	738920	0	0	0	0	1524588	0	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	1241084	0	0	0
ERO-EXP-5-2C	2012	Fall	EXP	ERO	5-2C	380770	290290	0	0	0	0	0	2438436	0	0	0	0	0	0	512720	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-3A	2012	Fall	EXP	ERO	5-3A	228462	316680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	904800	0	0	0	0	0	0
ERO-EXP-5-3B	2012	Fall	EXP	ERO	5-3B	228462	131950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-5-3C	2012	Fall	EXP	ERO	5-3C	152308	237510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	0	0	0
ERO-EXP-5-4A	2012	Fall	EXP	ERO	5-4A	76154	237510	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4B	2012	Fall	EXP	ERO	5-4B	76154	237510	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181714	0	0	0	0	0	0	0	0	0	0	1108380	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4C	2012	Fall	EXP	ERO	5-4C	152308	475020	0	0	0	0	0	1219218	0	0	0	0	0	508196	0	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5A	2012	Fall	EXP	ERO	5-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2940600	0	0
ERO-EXP-5-5B	2012	Fall	EXP	ERO	5-5B	76154	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	0	0
ERO-EXP-5-5C	2012	Fall	EXP	ERO	5-5C	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0
ERO-REF-1-1A	2012	Fall	REF	ERO	1-1A	0	184730	0	0	0	0	0	0	0	0	0	0	0	1524588	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	904800	0	0	0	588120	0	0
ERO-REF-1-1B	2012	Fall	REF	ERO	1-1B	0	131950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	227708	0	0	557960	0	0	588120	0	0
ERO-REF-1-1C	2012	Fall	REF	ERO	1-1C	0	131950	0	0	0	0	0	0	369460	0	0	0	0	508196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	588120	271440	0
ERO-REF-1-2A	2012	Fall	REF	ERO	1-2A	0	211120	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	0	0	0	350610	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0
ERO-REF-1-2B	2012	Fall	REF	ERO	1-2B	0	131950	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0
ERO-REF-1-2C	2012	Fall	REF	ERO	1-2C	0	105560	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	0	2672176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0
ERO-REF-1-3A	2012	Fall	REF	ERO	1-3A	76154	105560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	542880	0
ERO-REF-1-3B	2012	Fall	REF	ERO	1-3B	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	814320	0
ERO-REF-1-3C	2012	Fall	REF	ERO	1-3C	0	52780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1085760	0
ERO-REF-1-4A	2012	Fall	REF	ERO	1-4A	0	105560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4B	2012	Fall	REF	ERO	1-4B	0	105560	0	383786	0	0	0	0	0	0	0	0	0	0	512720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1357200	0	0	0	588120	0	0
ERO-REF-1-4C	2012	Fall	REF	ERO	1-4C	152308	158340	0	0	0	0	0	0	369460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1176240	0	0
ERO-REF-1-5A	2012	Fall	REF	ERO	1-5A	0	211120	0	0	0	0	0	0	0	0	0	0	0	508196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5B	2012	Fall	REF	ERO	1-5B	0	26390	0	0	0	0	0	0	0	0	0	0	1909882	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1764360	0	0
ERO-REF-1-5C	2012	Fall	REF	ERO	1-5C	0	26390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452400	0	0	0	2940600	0	0

Periphyton: Dea

ECO_ID	P041	P042	P043	P044	P045	P046	P047	P048	P049	P050	P051	P052	P053	P054	P055	P056	P057	P058	P059	P060	P061	P062	P063	P064	P065	P066	P067	P068	P069	P070	P071	P072	P073	P074	P075	P076	P077	P078	P079	P080	P081	P082	P083	P084	P085	P086	P087	P088	P089
DEP-EXP-1-1	0	0	0	0	0	0	371722	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	107068	0	0	0	0	0	0	0	2292160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-2	0	0	0	0	0	0	371722	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	53534	0	0	0	0	0	936468	0	0	0	1325532	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160602	0	0	0	0	0	0	0	0	4275180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-1	0	0	0	0	0	0	371722	0	0	0	0	0	241280	0	0	1511016	0	0	0	0	0	0	0	53534	0	0	0	0	0	468234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-2	0	0	0	0	0	0	371722	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	53534	0	0	0	0	0	936468	0	0	0	1325532	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-2-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	755508	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	883688	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-1	0	0	0	0	0	0	371722	0	0	0	0	0	120640	0	0	503672	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-2	0	0	0	0	0	0	0	0	0	0	0	0	120640	0	0	251836	0	0	0	0	0	0	0	107068	0	0	0	0	0	468234	0	0	0	1767376	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-3-3	0	0	0	0	0	0	1115166	0	0	0	0	0	603200	0	0	0	0	0	0	0	0	0	0	53534	0	0	0	0	0	1404702	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1259180	0	0	0	0	0	0	0	107068	0	0	0	0	0	0	0	0	0	883688	0	0	0	5564520	0	0	25636	0	0	0	0	0	0	0	0
DEP-EXP-4-2	0	0	0	0	0	0	371722	0	0	0	0	0	361920	0	0	0	6786000	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	4275180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-4-3	0	0	0	0	0	0	371722	0	0	0	0	0	0	0	0	251836	9048000	0	0	9792952	0	0	0	0	0	0	0	0	0	1872936	0	0	0	883688	8821800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	53534	0	0	0	0	0	0	0	0	0	883688	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3092908	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-5-3	0	0	0	0	0	0	0	0	0	0	0	0	60320	0	0	125918	0	0	0	0	0	0	0	53534	0	0	0	0	0	0	0	0	0	662766	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-1	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	0	0	0	0	936468	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-6-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	2292160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-1	0	0	0	0	0	0	743444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441844	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-2	0	0	0	0	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-7-3	0	0	0	0	0	0	371722	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	0	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-1	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	0	0	0	0	468234	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-2	0	0	0	0	0	0	743444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	160602	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-1-3	0	0	0	0	0	0	743444	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-1	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-2	0	0	0	2750592	0	0	743444	0	0	0	0	0	0	0	0	0	2262000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-REF-2-3	0	0	0	0	0	0	371722	0	0	0	0	0	241280	0	0	0	0	0	0	0	0	0	0	53534	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
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DEP-REF-3-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1A	0	0	0	0	0	0	371722	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53534	0	0	0	0	861068	1404702	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1B	0	0	0	0	0	0	0	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-1-2A	0	0	0	0	0	0	0	0	0	0	0	0	120640	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441844	0	0	0	0	0	0	25636	0	0	0	0	0	0	0	0
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ERO-EXP-1-5A	0	0	0	0	0	407914	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	441844	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-2-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	0	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-3-4C	0	0	0	0	0	0	0	0	0	0	0	0	241280	0	0	755508	0	0	0	0	0	0	0	53534	0	0	0	0	0	468234	0	0	0	1325532	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1404702	0	0	0	1325532	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	441844	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-4-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	883688	0	0	0	2782260	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-4-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	936468	0	0	4275180	0	0	0	0	0	0	0	0	0	0	38454	0	0	0	0	0
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Periphyton: Dea

ECO_ID	P041	P042	P043	P044	P045	P046	P047	P048	P049	P050	P051	P052	P053	P054	P055	P056	P057	P058	P059	P060	P061	P062	P063	P064	P065	P066	P067	P068	P069	P070	P071	P072	P073	P074	P075	P076	P077	P078	P079	P080	P081	P082	P083	P084	P085	P086	P087	P088	P089
ERO-EXP-4-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	0	441844	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	468234	0	0	4275180	0	0	0	0	5564520	0	0	0	0	0	0	0	0	0	0	0
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ERO-REF-1-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251836	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2782260	0	0	25636	0	0	0	0	0	0	0	0
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Periphyton: Dea

ECO_ID	P090	P091	P092	P093	P094	P095	P096	P097	P098	P099	P100	P101	P102	P103	P104	P105	P106	P107	P108	P109	P110	P111	P112	P113	P114	P115	P116	P117	P118	P119	P120	P121	P122	P123	P124	P125	P126	P127	P128	P129	P130	P131	P132	P133	P134	P135	P136	P137	P138	P139	P140	P141	P142	P143	P144	P145
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ERO-EXP-1-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	0	0	0	0
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Periphyton: Dea

ECO_ID	P090	P091	P092	P093	P094	P095	P096	P097	P098	P099	P100	P101	P102	P103	P104	P105	P106	P107	P108	P109	P110	P111	P112	P113	P114	P115	P116	P117	P118	P119	P120	P121	P122	P123	P124	P125	P126	P127	P128	P129	P130	P131	P132	P133	P134	P135	P136	P137	P138	P139	P140	P141	P142	P143	P144	P145
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ERO-EXP-5-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-REF-1-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75400	0	0	0	0
ERO-REF-1-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	716300	0	0	0	0	0	75400	0	0	0	0
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ERO-REF-1-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150800	0	0	0	0
ERO-REF-1-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Periphyton: Dea

ECO_ID	P146	P147	P148	P149	P150	P151	P152	P153	P154	P155	P156	P157	P158	P159	P160	P161	P162	P163	P164	P165	P166	P167	P168	P169	P170	P171	P172	P173	P174	P175	P176	P177	P178	P179	P180	P181	P182	P183	P184	P185	P186	P187	P188	P189
DEP-EXP-1-1	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEP-EXP-1-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-EXP-2-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-EXP-6-1	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-EXP-7-1	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-REF-2-3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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DEP-REF-3-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-1-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	235248	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-1-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-1-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-1-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-2-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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ERO-EXP-2-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-2-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-3A	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-3-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	83694	0	0	0	0
ERO-EXP-3-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-3-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	251082	0	0	0	0
ERO-EXP-3-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-3-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-3-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	91234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-4-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Periphyton: Dea

ECO_ID	P146	P147	P148	P149	P150	P151	P152	P153	P154	P155	P156	P157	P158	P159	P160	P161	P162	P163	P164	P165	P166	P167	P168	P169	P170	P171	P172	P173	P174	P175	P176	P177	P178	P179	P180	P181	P182	P183	P184	P185	P186	P187	P188	P189
ERO-EXP-4-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-4-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	0	0	0	0	0
ERO-EXP-4-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-4-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-4-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-4-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-4-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-5-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-5-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	0	0	0	0	0
ERO-EXP-5-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105560	334776	0	0	0	0
ERO-EXP-5-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253344	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-5-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	167388	0	0	0	0
ERO-EXP-5-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-5-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83694	0	0	0	0
ERO-EXP-5-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-EXP-5-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-1C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-2C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-3C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4A	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4B	0	0	0	0	0	208104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-4C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ERO-REF-1-5C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Periphyton Taxonomic Codes		
Final Code	Bacillariophyte-Diatoms	Peri Names and alternates
P001	Achnanthidium linearis	Achnanthidium linearis
P002	Achnanthidium minutissima	Achnanthidium minutissima
P003	Achnanthidium spp.	Achnanthidium spp.
P004	Amphora ovalis	Amphora ovalis
P005	Amphora perpusilla	Amphora perpusilla
P006	Amphora pediculus	Amphora pediculus
P007	Amphipleura pellucida	Amphipleura pellucida
P008	Anomoeoneis sp.	Anomoeoneis vitrea
P009	Asterionella formosa	Asterionella formosa
P010	Aulicoseira distans	Aulicoseira distans
P011	Aulacoseira granulata	Aulacoseira granulata
P012	Caloneis silicula	Caloneis silicula
P013	Cocconeis fluviatilis	Cocconeis fluviatilis
P014	Cocconeis placentula	Cocconeis placentula
P015	Cyclotella bodanica	Cyclotella bodanica
P016	Cyclotella comta	Cyclotella comta
P017	Cyclotella glomerata	Cyclotella glomerata
P018	Cyclotella ocellata	Cyclotella ocellata
P019	Cyclotella stelligera	Cyclotella stelligera
P020	Cymbella cistula	Cymbella cistula
P021	Cymbella parva	Cymbella parva
P022	Cymbella turgida	Cymbella turgida
P023	Denticula tenuis	Denticula tenuis
P024	Diatoma hiemale	Diatoma hiemale
P025	Diatoma tenue var elongatum	Diatoma tenue var elongatum
P026	Diatoma vulgare	Diatoma vulgare
P027	Didymosphenia geminata	Didymosphenia geminata
P028	Diploneis elliptica	Diploneis elliptica
P029	Epithemia sp.	Epithemia sp.
P030	Eucocconeis flexella	Eucocconeis flexella
P031	Eucocconeis sp.	Eucocconeis sp.
P032	Eunotia lunaris	Eunotia lunaris
P033	Eunotia pectinalis	Eunotia pectinalis
P034	Fragilaria crotonensis	Fragilaria crotonensis
P035	Fragilaria capucina (intermedia)	Fragilaria capucina (intermedia)
P036	Fragilariforma virescens	Fragilariforma virescens
P037	Frustulia rhomboides	Frustulia rhomboides
P038	Gomphonema ovilaceum	Gomphonema ovilaceum
P039	Gomphonema sp.	Gomphonema sp.
P040	Gyrosigma sp.	Gyrosigma sp.
P041	Hannaea arcus	Hannaea arcus
P042	Meridion anceps	Meridion anceps
P043	Meridion circulare	Meridion circulare
P044	Navicula gastrum	Navicula gastrium
P045	Navicula radiosa	Navicula radiosa

P046	Navicula tripunctata	Navicula tripunctata
P047	Navicula spp.	Navicula spp.
P048	Neidium bisulcatum	Neidium bisulcatum
P049	Neidium spp.	Neidium spp.
P050	Nitzschia acicularis	Nitzschia acicularis
P051	Nitzschia hantzschiana	Nitzschia hantzschiana
P052	Nitzschia obtusa	Nitzschia obtusa
P053	Nitzschia palea	Nitzschia palea
P054	Nitzschia stellata	Nitzschia stellata
P055	Nitzschia - sigmoid sp.?	Nitzschia - sigmoid sp.?
P056	Nitzschia sp.	Nitzschia sp.
P057	Pinnularia sp.	Pinnularia sp.
P058	Pleurosigma sp.	Pleurosigma sp.
P059	Rhoicosphenia curvata	Rhoicosphenia curvata
P060	Rhopalodia gibba	Rhopalodia gibba
P061	Stauroneis phoenicenteron.	Stauroneis phoenicenteron.
P062	Stauroforma exiguiformis	Stauroforma exiguiformis
P063	Staurosira ansata	Staurosira ansata
P064	Staurosira construens v ventor	Staurosira construens v ventor
P065	Staurosira construens v. plumila	Staurosira construens v. plumila
P066	Staurosirella leptostauron	Staurosirella leptostauron
P067	Staurosirella pinnata (cf. Fragilaria pinnata)	Staurosirella pinnata (cf. Fragilaria pinnata)
P068	Stephanodiscus hantzschii	Stephanodiscus hantzschii
P069	Stephanodiscus sp	Stephanodiscus sp
P070	Synedra acus	Synedra acus
P071	Synedra acus var angustissima	Synedra acus var angustissima
P072	Synedra nana	Synedra nana
P073	Synedra ulna	Synedra ulna
P074	Synedra ulna var radians	Synedra ulna var radians
P075	Surirella ovata	Surirella ovata
P076	Surirella angusta	Surirella angustata
P077	Surirella sp.	Surirella sp.
P078	Tabellaria fenestrata	Tabellaria fenestrata
P079	Tabellaria flocculosa	Tabellaria flocculosa
P080	Not Identified Flagellates	Not Identified Flagellates
P081	Chromulina sp.	Chromulina sp
P082	Chroomonas acuta.	Chroomonas acuta.
P083	Chrysochromulina sp.	Chrysochromulina sp.
P084	Chrysococcus sp.	Chrysococcus sp.
P085	Cryptomonas sp.	Cryptomonas sp.
P086	Dinobryon divergens (lorica)	Dinobryon divergens
P087	Dinobryon sertularia (lorica)	Dinobryon sertularia
P088	Kephyrion sp.	Kephyrion sp.
P089	Komma sp.	Komma sp.
P090	Mallomonas sp.	Mallomonas sp.
P091	Ceratium hirudinella	Ceratium hirudinella
P092	Gymnodinium sp.	Gymnodinium sp.
P093	Peridinium sp.	Peridinium sp

P094	Anabaena sp. (filaments)	Anabaena sp. (filaments)
P095	Anacystis cyanea	Anacystis cyanea
P096	Coelosphaerium sp. (spheric colony)	Coelosphaerium sp. (spheric colony)
P097	Gloeotrichia sp.	Gloeotrichia sp.
P098	Limnothrix redekei (filament)	Limnothrix redekei (filament)
P099	Lyngbya sp.	Lyngbya sp. 100 micron length
P100	Merismopedia elegans	Merismopedia elegans
P101	Oscillatoria sp. (4 micron dia)	Oscillatoria 4mi sp. (100 L)
P102	Planktolyngbya limnetica (filament)	Planktolyngbya limnetica 100L)
P103	Planktothrix agardhii (filament)	Planktothrix agardhii (100 L filament)
P104	Planktothrix limnetica (filament)	Planktothrix limnetica (100 L filament)
P105	Pseudanabaena sp. (filament 1.5micron dia)	Pseudanabaena sp. 1.5mi (100 L)
P106	Synechococcus sp.	Synechococcus sp.
P107	Synechocystis sp.	Synechocystis sp
P108	Distigma sp. -flagellate	Distigma sp. -flagellate
P109	Euglena spp. -flagellate	Euglena spp. -flagellate
P110	Trachelomonas sp. -flagellate	Trachelomonas sp. -flagellate
P111	Ankistrodesmus spp.	Ankistrodesmus spp.
P112	Botryococcus sp. (colony)	Botryococcus sp. (colony)
P113	Chlamydocapsa sp.	Chlamydocapsa sp.
P114	Chlorella spp.	Chlorella spp.
P115	Closterium sp.	Closterium sp.
P116	Cosmarium spp.	Cosmarium spp
P117	Dichtyosphaerium sp.	Dichtyosphaerium
P118	Eremosphaera sp. (colony)	Eremosphaera sp. (colony)
P119	Euastrum sp.	Euastrum sp.
P120	Gloeocystis sp. colony	Gloeocystis sp. colony
P121	Hyalotheca sp.	Hyalotheca sp.
P122	Oocystis sp. (cells)	Oocystis sp. (cells)
P123	Pediastrum sp. (colony)	Pediastrum sp.
P124	Planctosphaeria sp. (colony)	Planctosphaeria sp. colony
P125	Scenedesmus sp.	Scenedesmus sp.
P126	Spondylosium sp. (cells - filaments)	Spondylosium sp. (cells - filaments)
P127	Staurastrum sp. (cell)	Staurastrum sp.
P128	Bulbochaete (cells)	Bulbochaete (cells)
P129	Cladophora zonata	Cladophora sp. glomerata?
P130	Draparnaldia sp. glomerata?	Draparnaldia sp. glomerata?
P131	Geminella sp. (I cell)	Geminella sp I cell
P132	Microspora sp.	Microspora sp.
P133	Mougeotia sp.	Mougeotia sp.
P134	Oedogonium sp.	Oedogonium sp.
P135	Stigeoclonium sp.	Stigeoclonium sp.
P136	Spirogyra sp.	Spirogyra sp.
P137	Ulothrix sp. (zonata?)	Ulothrix sp. (zonata)
P138	Zygnema sp.	Zygnema sp.
P139	Aphanothece (saxicola?)	Coccoid Chlorophyta Complex (colony) unidentifiable
P140	pico-flagellates	***moved to D012

P141	Brachysira vitrea	Brachysira vitrea
P142	Hantzschia spp.	Hantzschia spp.
P143	Rhizosolenia sp.	Rhizosolenia sp.
P144	Rossithidium linearis	Rossithidium linearis
P145	Ochromonas sp.	Oochromonas sp.
P146	Anabaenopsis elenkinii	Anabaenopsis elenkinii
P147	Coelastrum sp. (colony)	Coelastrum sp. (colony)
P148	Scourfieldia sp. -flagellate	*** changed to P145 Ochromonas
P149	Stichococcus minutissima	Stichococcus minutissima
P150	Navicula minima (oval)	Navicula minima (oval)
P151	Stauroneis sp.	Stauroneis sp
P152	Gomphosphaeria sp.	Gomphosphaeria sp
P153	Lepocinclis ovum	Lepocinclis ovum
P154	Small euglenoid	Chlamydomonas spp.
P155	Leptolyngbya sp.	Leptolyngbya
P156	amoeba	amoeba
P157	Spirulina sp.	Spirolina
P158	Dactylococcopsis sp.	Dactylococcopsis
P159	Campylodiscus sp.	Campylodiscus sp.
P160	Euglenoid large	Euglenoid (Phacus?)
P161	Peranema sp.	Peranema sp.
P162	Gomphonema parvulum	Gomphonema parvulum
P163	Staurosirella sp.	Staurosirella sp.
P164	Cymbella minuta	Cymbella minuta
P165	Gomphonema minutum	Gomphonema minutum
P166	Aphanocapsa sp.	Aphanocapsa sp.
P167	Caloneis sp.	Caloneis sp.
P168	Achnanthidium exiguum	Achnanthidium exiguum
P169	Amphora sp.	Amphora sp
P170	Frustulia sp.	Frustulia sp.
P171	Diploneis sp.	Diploneis sp.
P172	Cymbella spp.	Cymbella sp.
P173	Glenodinium sp.	Glenodinium sp.
P174	Stigonema ocellata	Stigonema ocellata
P175	Chroococcus sp.	Chroococcus sp.
P176	Cymbolpleura sp.	Cymbolpleura sp.
P177	Encyonema minuta	Encyonema minuta
P178	Gomphoneis minuta	Gomphoneis minuta
P179	Cymatopleura sp.	Cymatopleura sp.
P180	Dinobryon bavaricum	Dinobryon bavaricum
P181	Cyclotella sp. (Wehr)	Cyclotella sp. (Wehr)

P182	Calothrix (fusca?)	Calothrix (fusca?)
P183	Phacus (trimarginatus?)	Phacus (trimarginatus?)
P184	Navicula lancelota	Navicula lancelota
P185	Cycolotella ocellata+comta=rossi	Cycolotella ocellata+comta=rossi
P186	Bodo sp.	Bodo sp.
P187	Eunotia spp.	Eunotia spp.
P188	Komvophoron minutissima	Komvophoron minutissima
P189	Gomphonema acuminata	Gomphonema acuminata

APPENDIX F

BENTHIC INVERTEBRATE TAXONOMY

Cordillera Consulting

Project: Teck 12-976
Ecoscape
Taxonomist: Sue Salter
suesalter@shaw.ca
250-494-7553

Site:	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-3	ERO-EXP-3	ERO-EXP-3
Sample:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3
CC#:	CC131228	CC131229	CC131230	CC131231	CC131232	CC131233	CC131234	CC131235	CC131236	CC131237	CC131238	CC131239	CC131240	CC131241	CC131242	CC131243	CC131244	CC131245	CC131246	CC131247	CC131248	CC131249	CC131250
Phylum: Arthropoda																							
Subphylum: Hexapoda																							
| Class: Insecta																							
| Order: Ephemeroptera																							
| Family: Ameletidae																							
Ameletus													5										
| Family: Baetidae																							
Acentrella sp.																							
Baetis sp.	3						120	40					20		120	40	20		40	60			30
Baetis tricaudatus group	6			7		160	140	60					5		120	80		20	60	260	100	4	40
| Family: Ephemerellidae	21	15	6			80	220		2					6	200		20			120	29	11	
Drunella doddsii																							
Drunella grandis group	3					400	240	100			8	4		2	160	240	320	60	240	280	14	7	20
Ephemerella sp.	124			386				140			158	50	235		320	1080				320		70	190
| Family: Ephemeridae																							
Ephemera simulans																							
| Family: Heptageniidae	3	8	10	107	8	40	40		2		75	32	35	54	40	120		20		60	14	26	20
Heptagenia sp.		8			38		20					18	40									30	
| Family: Leptohyphidae																							
Tricorythodes sp.											8												
| Family: Leptophlebiidae																							
Paraleptophlebia sp.												11		2									
| Order: Plecoptera																							
| Family: Chloroperlidae																							
Suwallia sp.																							
Sweltsa sp.																							
| Family: Perlodidae				7																			
Isoperla sp.				7																			
Skwala sp.																20						4	
| Family: Taeniopterygidae																							
Taenionema sp.																							
| Order: Trichoptera	3	8	6		8				33	4					20								
| Family: Apataniidae																							
Apatania sp.									2	3													
| Family: Brachycentridae																							
Brachycentrus occidentalis	3			7		680	220				42	7	20	2	460	260	1400	700	1120	680	571		340
| Family: Glossosomatidae																							
Glossosoma sp.	88		44	200		40	20				100	11	40	24	340	420	780	40	260	280	57	4	150
Protoptila sp.			38		85			100	20		8	4	5	20								4	
| Family: Hydropsychidae	115	15	4	243	23	2000	520	1440	20		83	61	205	8	1160	1360	4400	1220	1220	1420	1043	81	400
Cheumatopsyche sp.	118		14	300	38	400	1400	1400	7		750	229	265	72	1000	2400	2000	800	840	1040	186	278	140
Hydropsyche sp.	85	8	20	514	23	13200	8600	4000	9	1	833	107	395	8	9500	7800	16800	4600	11420	9880	2571	126	1840
| Family: Lepidostomatidae																							
Lepidostoma sp.	3																					7	
| Family: Leptoceridae																							
Ceraclea sp.	41	69	140	200	115			120	42	10	183	136	130	94	60	180	60	120	40		29	185	40
Mystacides sp.																							
Triaenodes sp.																							
| Family: Limnephilidae																							
Dicosmoecus sp.																20							
| Family: Polycentropodidae																							
Polycentropus sp.		15																					
| Family: Psychomyiidae																							
Psychomyia sp.	3										8	4	15	2		20							
| Order: Coleoptera																							
| Family: Dytiscidae																							
Oreodytes sp.									18		8										14		
| Family: Elmidae																							
Cleptelmis sp.													5	2									
Dubiraphia sp.																							
Heterlimnius sp.										1													
Narpus sp.											8												
Optioservus sp.	3																						
Zaitzevia sp.						20				1										20			
| Order: Diptera														2									
| Family: Ceratopogonidae																							
Culicoides sp.																							
Probezzia sp.																							
| Family: Chironomidae																							
| Subfamily: Chironominae																							
| Tribe: Chironomini																							
Chironomus sp.									2														
Cryptochironomus sp.			2						2				5										
Dicrotendipes sp.																							
Microtendipes pedellus	3		6		15						8			2								15	
Paracladopelma sp.																							
Paralauterborniella nigrohalteris																							
Phaenopsectra sp.									2														
Polypedilum sp.			4								17			4	20								
Robackia demeijerei																							
| Tribe: Tanytarsini																							
Micropsectra sp.																							
Paratanytarsus sp.																							
Rheotanytarsus sp.									2														
Tanytarsus sp.																							
| Subfamily: Diamesinae																							
| Tribe: Diamesini																							
Pagastia sp.	3		18	14					4		8						40			40	14	15	20
Potthastia longimana group			2																				
| Subfamily: Orthocladiinae																40							
Eukiefferiella sp.				36			80					4						20	40	60		4	
Orthocladius complex	18		46	121							33	25	70	4	60						57		20
Parakiefferiella sp.																							
Synorthocladius sp.	15	23	4		23							11	20	6									
Tvetenia sp.	38						80	100	13		50	7	35	10	80	20	20	20		100	29	7	50
| Subfamily: Prodiamesinae																							
Monodiamesa sp.														2									

Site:	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-3	ERO-EXP-3	ERO-EXP-3
Sample:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3
CC#:	CC131228	CC131229	CC131230	CC131231	CC131232	CC131233	CC131234	CC131235	CC131236	CC131237	CC131238	CC131239	CC131240	CC131241	CC131242	CC131243	CC131244	CC131245	CC131246	CC131247	CC131248	CC131249	CC131250
| Subfamily: Tanypodinae	0		0		0		0		0		0		0		0		0		0		0		0
Guttipelopia guttipennis	0		0		0		0		0		0	4	0		0		0		0		0		0

Site:	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-3	ERO-EXP-3	ERO-EXP-3
Sample:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3
CC#:	CC131228	CC131229	CC131230	CC131231	CC131232	CC131233	CC131234	CC131235	CC131236	CC131237	CC131238	CC131239	CC131240	CC131241	CC131242	CC131243	CC131244	CC131245	CC131246	CC131247	CC131248	CC131249	CC131250
| Tribe: Pentaneurini																							
Thienemannimyia group																							
| Tribe: Procladiini																							
Procladius sp.														2									
| Family: Empididae																							
Hemerodromia sp.	3		4											2								22	
| Family: Psychodidae																							
Pericoma sp.															20								
| Family: Simuliidae																							
Simulium sp.	3																						
| Family: Tabanidae																							
| Family: Tipulidae																							
Antocha sp.				7		20						4						20		20		4	
| Order: Hemiptera																							
| Family: Corixidae		8							11	1												4	
Callicorixa sp.									24	22												11	
Sigara sp.																							
| Order: Odonata																							
| Family: Gomphidae																							
Subphylum: Crustacea																							
| Class: Malacostraca																							
| Order: Amphipoda	3		8		15				9	1	8	36	175	70									
| Family: Crangonyctidae																							
Crangonyx sp.	50	46	2	7	46	20			20	7		36	40							20		26	
| Family: Gammaridae																							
Gammarus sp.	6	23											10	8									
| Family: Hyalellidae																							
Hyalella sp.		31		21	23							29										4	
| Order: Decapoda																							
| Family: Astacidae																							
Pacifastacus sp.												7		2									
| Order: Isopoda																							
| Family: Asellidae																							
Lirceus sp.		8							2														
Subphylum: Chelicerata																							
| Class: Arachnida																							
| Order: Trombidiformes	3		2											2									10
| Family: Hydryphantidae																							
Protzia sp.	3		2																				
| Family: Hygrobatidae																							
Atractides sp.																						4	
Hygrobates sp.	3		2	7	92	40			11		50	21	15	4								4	
| Family: Lebertiidae																							
Lebertia sp.	9	8	16	21					7	2	17	7	10	10								26	
| Family: Sperchontidae																							
Sperchon sp.			2	7		220	40	20							40		20	20	40			4	10
| Family: Torrenticolidae																							
Torrenticola sp.									2		8												
Phylum: Mollusca																							
| Class: Bivalvia																							
| Order: Veneroida																							
| Family: Pisidiidae																							
| Family: Unionoida																							
| Family: Margaritiferidae																							
Margaritifera falcata																							
Pisidium sp.	9	77	4		23				29	9	8	7	5	8									
Sphaerium sp.																							
| Class: Gastropoda	15	169	44	36	85			40	53		92	61		34	40	20		20				15	
| Order: Basommatophora																							
| Family: Lymnaeidae																							
Fisherola nuttalli	3																						
Lymnaea sp.	12	969	20		408			60	76	83	17	111		54			20	20				19	
| Family: Physidae																							
Physa sp.	32	108	20	36	85				78	53	8	36	40	12		100						130	
| Family: Planorbidae																							
Gyraulus sp.		454			169				11	37		11		10								7	
Helisoma sp.																							
Menetus opercularis										2												7	
| Order: Heterostropha																							
| Family: Valvatidae																							
Valvata sincera																							
Valvata sp.	6							20															
Valvata tricarinata																							
| Order: Hypsogastropoda																							
| Family: Lithoglyptidae																							
Fluminicola sp.	53	15	116	64	969	220	20	120	116	132	392	111	25	82	40	20		20	20			7	40
Phylum: Annelida																							
Subphylum: Clitellata																							
| Class: Hirudinea																							
| Order: Arhynchobdellida																							
| Family: Erpobdellidae									7														
| Order: Rhynchobdellida																							
| Family: Glossiphoniidae																							
| Class: Oligochaeta									7														
| Order: Lumbriculida																							
| Family: Lumbriculidae		192	2							1			5										
Rhynchelmis sp.		8																					
| Order: Tubificida																							
| Family: Enchytraeidae																							
Enchytraeus	50	23	6					60	9				20			20	40						
| Family: Lumbricidae																							
| Family: Naididae		77	6		54				49														
Nais sp.			2																				10
Pristina sp.	3																						
Phylum: Cnidaria																							
| Class: Hydrozoa																							

Site:	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-1	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-REF-2	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-1	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-2	ERO-EXP-3	ERO-EXP-3	ERO-EXP-3
Sample:	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3
CC#:	CC131228	CC131229	CC131230	CC131231	CC131232	CC131233	CC131234	CC131235	CC131236	CC131237	CC131238	CC131239	CC131240	CC131241	CC131242	CC131243	CC131244	CC131245	CC131246	CC131247	CC131248	CC131249	CC131250
| Order: Anthoathecatae	0		0		0		0		0		0		0		0		0		0		0		0
| Family: Hydridae	0		0		0		0		0		0		0		0		0		0		0		0
Hydra sp.	0		0		0		0		0		0		0		0		0		0		0		0
Totals:	**965**	**2385**	**622**	**2355**	**2345**	**17540**	**11760**	**7820**	**701**	**370**	**2988**	**1202**	**1895**	**626**	**13800**	**14260**	**25940**	**7720**	**15340**	**14660**	**4728**	**1172**	**3370**

Taxa present but not included:
Copepoda
Daphnia sp.
Nemata
No Invertebrates Found
Ostracoda
Turbellaria

Cordillera Consulting

Project: Teck 12-976
Ecoscape
Taxonomist: Sue Salter
suesalter@shaw.ca
250-494-7553

Site:	ERO-EXP-3	ERO-EXP-3	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2
Sample:	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131251	CC131252	CC131253	CC131254	CC131255	CC131256	CC131257	CC131258	CC131259	CC131260	CC131261	CC131262	CC131263	CC131264	CC131265	CC131266	CC131267	CC131268	CC131269	CC131270	CC131271	CC131272
Phylum: Arthropoda		0		0		0		0		0		0		0		0		0		0		0
Subphylum: Hexapoda		0		0		0		0		0		0		0		0		0		0		0
| Class: Insecta		0		0		0		0		0		0		0		0		0		0		0
| Order: Ephemeroptera		0		0		0		0		0		0		0		0		0		0		0
| Family: Ameletidae		0		0		0		0		0		0		0		0		0		0		0
Ameletus		0		0		0		0		0		0		0		0		0		0		0
| Family: Baetidae	20	0		0		0		0		0		0		0		0		0		0		0
Acentrella sp.		0		0	1	0		0		0		0		0		0		0		0		0
Baetis sp.	180	0		0	1	20		0		33	27	0		0		0		0		0		0
Baetis tricaudatus group	280	160	6	2	11	40		0		42	7	2		0		0		0		0		0
| Family: Ephemerellidae	80	0	12	1	4	280	5	0	180	292	207	2		0		0		0		0		0
Drunella doddsii		0		0	1	0		0		0		0		0		0		0		0		0
Drunella grandis group	180	60	2	1	1	40	3	0	40	50	20	1		0		0		0		0		0
Ephemerella sp.	140	1000		30	17	720		0		133	87	0		0		0		0		0		0
| Family: Ephemeridae		0		0		0		0		0		0		0		0		0		0		0
Ephemera simulans		0		0		0		0		0		0		1		0		0		0		0
| Family: Heptageniidae	60	140	5	1	5	20		0	20	0	7	0		0		0		0		0		0
Heptagenia sp.		0	1	0	2	40		0		0		0		0		0		0		0		0
| Family: Leptohyphidae		0		0		0		0		0		0		0		0		0		0		0
Tricorythodes sp.		0		0		0		0		0		0		0	1	0		0		0	1	0
| Family: Leptophlebiidae		0		0		0		0		0		0		0		0		0		0		0
Paraleptophlebia sp.		0		0		0		0		0		0		0		0		0		0		0
		0		0		0		0		0		0		0		0		0		0		0
| Order: Plecoptera		0		0		0		0		0		0		0		0		0		0		0
| Family: Chloroperlidae		0		0		0		0		0		0		0		0		0		0		0
Suwallia sp.		0		1		0		0		0		0		0		0		0		0		0
Sweltsa sp.		0	1	0		0		0		0		0		0		0		0		0		0
| Family: Perlodidae		0		0		0		0		0	7	0		0		0		0		0		0
Isoperla sp.		0		0		0		0		0		0		0		0		0		0		0
Skwala sp.		0	10	0	1	0		8		58	13	0		0		0		0		0		0
| Family: Taeniopterygidae		0		0		0		0		0		0		0		0		0		0		0
Taenionema sp.		0		1	1	0		0		0		0		0		0		0		0		0
		0		0		0		0		0		0		0		0		0		0		0
| Order: Trichoptera		0		0	2	20	1	8		0		0		0		0		0		0		0
| Family: Apataniidae		0		0		0		0		0		0		0		0		0		0		0
Apatania sp.		0	1	0		0		0		0		0		0		0		0		0		0
| Family: Brachycentridae		0		0		0		0		0		0		0	1	0		0		0		0
Brachycentrus occidentalis	940	220		0		240	1	0	240	75	213	2		0		0		1	3	0		0
| Family: Glossosomatidae		0		0		0		0		0		0		0		0		0		0		0
Glossosoma sp.	60	500	5	12	18	1060	16	77	220	117	800	1		0		0		0		0		0
Protoptila sp.		0	9	12	5	0	9	292		0		0		0		0		0		0		0
| Family: Hydropsychidae	200	200	15	5	14	1400	22	0	220	375	273	14		0		0		0		0		0
Cheumatopsyche sp.	1440	1260	12	31	26	1200	4	15	2240	158	107	10		0		0		0		0		0
Hydropsyche sp.	3440	5060	20	3	9	4220	16	0	3440	1167	133	10		0		0		0		0		0
| Family: Lepidostomatidae		0		0		0		0		0		0		0		0		0		0		0
Lepidostoma sp.		0		3	4	0	1	0		0		0		0		0		0		0		0
| Family: Leptoceridae		0		0		0		0		0		0		0		5		1	8	0		0
Ceraclea sp.	20	180	21	8	14	320	26	62	240	25	27	4		0		0		0	1	0		0
Mystacides sp.		0		0		0		0		0		0	18	5	9	2	11	6		0		0
Triaenodes sp.		0		0		0		0		0		0		0		0	1	0		0		0
| Family: Limnephilidae		0		0		0		0		0		0		0		0		0		0		0
Dicosmoecus sp.		0		0		0		0		0		0		0		0		0		0		0
| Family: Polycentropodidae		0		0		0		0		0		0		0		0		0		0		0
Polycentropus sp.		0		0		0		0		0		0		0		0		0		0		0
| Family: Psychomyiidae		0		0		0		0		0		0		0		0		0		0		0
Psychomyia sp.		0		0	1	0		8		8		0		0		0		0		0		0
		0		0		0		0		0		0		0		0		0		0		0
| Order: Coleoptera		0		0		0		0		0		0		0		0		0		0		0
| Family: Dytiscidae		0		0		0		0		0		0		0		0		0		0		0
Oreodytes sp.		0		0	1	0		15		0		0		0		0		0		0		0
| Family: Elmidae		0		0		0		8		0		0		0		0		0		0		0
Cleptelmis sp.		0		0		0		0		0		0		0		0		0		0		0
Dubiraphia sp.		0		0		0		0		0		0		0		0	2	0		0		0
Heterlimnius sp.		0	1	0		0		0		0		0		0		0		0		0		0
Narpus sp.		0		0		0		0		0		0		0		0		0		0		0
Optioservus sp.		0		0		0	1	0		8	7	0		0		0		0		0		0
Zaitzevia sp.		0		1	1	0		0		0		0		0		0		0		0		0
		0		0		0		0		0		0		0		0		0		0		0
| Order: Diptera		0		1		0		0		0		0		0		0		0		0		0
| Family: Ceratopogonidae		0		0		0		0		0		0		0		0		0		0		0
Culicoides sp.		0		0		0		0		0		0		0		0		1		0		0
Probezzia sp.		0		0		0		0		0		0		0	1	5	4	0		0		0
| Family: Chironomidae		0		10		0		0		0		0		0		0		0		0		0
| Subfamily: Chironominae		0		0		0		0		0		0		0		0		0		0		0
| Tribe: Chironomini		0		0		0		0		0		0		0		0		0		0		0
Chironomus sp.		0		0		0		0		0		0	67	56	63	80	119	0	8	16	2	6
Cryptochironomus sp.		0		0		0		0		0		0		0	5	7		17	26	22	5	0
Dicrotendipes sp.		0		0		0		0		0		0		0		0		6		0		0
Microtendipes pedellus		0	3	9	5	0		54		0		0		0		0		0		0		0
Paracladopelma sp.		0		0		0		0		0		0	3	0		0		0		0		0
Paralauterborniella nigrohalteris		0		0		0		0		0		0		5		0	3	0		0		0
Phaenopsectra sp.		0		0		0		0		0		0	64	26	24	22	29	0		0	6	10
Polypedilum sp.		0		0	1	0		8		0		0		4	27	27	30	0	5	14		0
Robackia demeijerei		0		1		0		0		0		0		0		0		0		0		0
| Tribe: Tanytarsini		0		0		0		0		0		0		0		0		0		0		0
Micropsectra sp.		0		0		0		0		0		0		0		0		11		6		8
Paratanytarsus sp.		0		0		0		0		0		0		0		0		0		0		0
Rheotanytarsus sp.		0		0		0		0		0		0		0		0		0		0		0
Tanytarsus sp.		0		0		0		0		0		0	15	0	4	0		0		0		0
| Subfamily: Diamesinae		0		0		0		0		0		0		0		0		0		0		0
| Tribe: Diamesini		0		0		0		0		0		0		0		0		0		0		0
Pagastia sp.		0		0		20	3	8		0	20	0		0		0		0		0		0
Potthastia longimana group		0	1	0		0		0		0		0		0		0		0		0		0
| Subfamily: Orthocladiinae		0		0		0		0		0		0		0		0		0		0		0
Eukiefferiella sp.		80		0		0		0		0		0		0		0		0		0		0
Orthocladius complex		80	8	4	16	40		0		0	7	0		0		0		0		0		0
Parakiefferiella sp.		0		0		0		0		0		0		0		0		0		0		0
Synorthocladius sp.		0		0		0		0		0	7	0		0		0		0		0		0
Tvetenia sp.		140	6	0	4	300		0	60	50	60	5		0		0		0		0		0
| Subfamily: Prodiamesinae		0		0		0		0		0		0		0		0		0		0		0
Monodiamesa sp.		0		0		0		0		0		0		0		0		0		0		0

Site:	ERO-EXP-3	ERO-EXP-3	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2
Sample:	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131251	CC131252	CC131253	CC131254	CC131255	CC131256	CC131257	CC131258	CC131259	CC131260	CC131261	CC131262	CC131263	CC131264	CC131265	CC131266	CC131267	CC131268	CC131269	CC131270	CC131271	CC131272
| Subfamily: Tanypodinae		0		0		0		0		0		0		0		0		0		0		0
Guttipelopia guttipennis		0		0		0		0		0		0		1		0		0		0		0

Site:	ERO-EXP-3	ERO-EXP-3	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2
Sample:	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131251	CC131252	CC131253	CC131254	CC131255	CC131256	CC131257	CC131258	CC131259	CC131260	CC131261	CC131262	CC131263	CC131264	CC131265	CC131266	CC131267	CC131268	CC131269	CC131270	CC131271	CC131272
| Tribe: Pentaneurini																						
Thienemannimyia group						20																
| Tribe: Procladiini																						
Procladius sp.													15		23	15	9					
| Family: Empididae																						
Hemerodromia sp.			3		1		1															
| Family: Psychodidae																						
Pericoma sp.																						
| Family: Simuliidae	40									8	7											
Simulium sp.																						
| Family: Tabanidae															2							
| Family: Tipulidae																						
Antocha sp.						20				8												
| Order: Hemiptera																						
| Family: Corixidae													3	1			1					
Callicorixa sp.							1	8						1	1	2	2			6		2
Sigara sp.								8														
| Order: Odonata																						
| Family: Gomphidae																						
Subphylum: Crustacea																						
| Class: Malacostraca																						
| Order: Amphipoda			1	1			2								1			2	5			8
| Family: Crangonyctidae																						
Crangonyx sp.			16	2	5		6	8											1			
| Family: Gammaridae																						
Gammarus sp.		20								8											2	2
| Family: Hyalellidae																						
Hyalella sp.			1																2			
| Order: Decapoda																						
| Family: Astacidae																						
Pacifastacus sp.																						
| Order: Isopoda													18									
| Family: Asellidae																						
Lirceus sp.													45	16	17	39	17	2	264	6	160	492
Subphylum: Chelicerata																						
| Class: Arachnida																						
| Order: Trombidiformes		20	1		1		1															
| Family: Hydryphantidae																						
Protzia sp.																						
| Family: Hygrobatidae																						
Atractides sp.		20																				
Hygrobates sp.			12	2	3		1	138										1				
| Family: Lebertiidae																						
Lebertia sp.		20	14	2	3				20	8				1								
| Family: Sperchontidae																						
Sperchon sp.	60	60		1	2					58	27											
| Family: Torrenticolidae																						
Torrenticola sp.			1				1		20													
Phylum: Mollusca																						
| Class: Bivalvia																						
| Order: Veneroida																						
| Family: Pisidiidae																						
| Family: Unionoida																						
| Family: Margaritiferidae																						
Margaritifera falcata																						
Pisidium sp.					3		5		20		7		215	144	149	166	60	20	140	38	12	16
Sphaerium sp.													6									
| Class: Gastropoda			3	1	11	20	28	77	20		20	4			2				4			2
| Order: Basommatophora																						
| Family: Lymnaeidae																						
Fisherola nuttalli																						
Lymnaea sp.			21	11	30		237	892				8			1							2
| Family: Physidae																						
Physa sp.			14	3	2	20	83	192	80	8	13	2			1			1				
| Family: Planorbidae			1																			
Gyraulus sp.			3	2	7		74	277														
Helisoma sp.																						
Menetus opercularis			2	1	1		5											1				10
| Order: Heterostropha																						
| Family: Valvatidae																						
Valvata sincera				1									6		3							
Valvata sp.														1	4		2					2
Valvata tricarinata													15	10	14	15	3					
| Order: Hypsogastropoda																						
| Family: Lithoglyptidae																						
Fluminicola sp.	20	20	160	13	78	80	1	254			7											
Phylum: Annelida																						
Subphylum: Clitellata																						
| Class: Hirudinea																						
| Order: Arhynchobdellida																						
| Family: Erpobdellidae																5			3		1	
| Order: Rhynchobdellida																						
| Family: Glossiphoniidae																			1		2	
| Class: Oligochaeta											13		3	11	3		4		5		1	
| Order: Lumbriculida																						
| Family: Lumbriculidae			11					8				4	148					48				
Rhynchelmis sp.					6					17			6	1	1							
| Order: Tubificida																						
| Family: Enchytraeidae																						
Enchytraeus					2		36															
| Family: Lumbricidae														2				1	3			
| Family: Naididae			85				2						273	165	245	402	54		186	550	16	112
Nais sp.																						
Pristina sp.																						
Phylum: Cnidaria																						
| Class: Hydrozoa																						

	Site:	ERO-EXP-3	ERO-EXP-3	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-4	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	ERO-EXP-5	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-1	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2	DEP-REF-2
	Sample:	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	CC#:	CC131251	CC131252	CC131253	CC131254	CC131255	CC131256	CC131257	CC131258	CC131259	CC131260	CC131261	CC131262	CC131263	CC131264	CC131265	CC131266	CC131267	CC131268	CC131269	CC131270	CC131271	CC131272
| Order: Anthoathecatae			0		0		0		0		0		0		0		0		0		0		0
| Family: Hydridae			0		0		0		0		0		0		0		0		0		0		0
Hydra sp.			0		2	1	0		0		0		0		0		0		0		0		0
	Totals:	**7160**	**9240**	**488**	**179**	**322**	**10140**	**592**	**2425**	**7060**	**2706**	**2123**	**69**	**920**	**451**	**602**	**792**	**351**	**119**	**665**	**658**	**208**	**672**

Taxa present but not included:
Copepoda
Daphnia sp.
Nemata
No Invertebrates Found
Ostracoda
Turbellaria

Cordillera
Consulting

Project: Teck 12-976
Ecoscape
Taxonomist: Sue Salter
suesalter@shaw.ca
250-494-7553

Site:	DEP-REF-2	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-5	DEP-EXP-5
Sample:	Sweep	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2
CC#:	CC131273	CC131274	CC131275	CC131276	CC131277	CC131278	CC131279	CC131280	CC131281	CC131282	CC131283	CC131284	CC131285	CC131286	CC131287	CC131288	CC131289	CC131290	CC131291	CC131292	CC131293	CC131294	CC131295	CC131296	CC131297	CC131298	CC131299	CC131300
Phylum: Arthropoda																												
Subphylum: Hexapoda																												
| Class: Insecta																												
| Order: Ephemeroptera																												
| Family: Ameletidae																												
Ameletus																												
| Family: Baetidae																												
Acentrella sp.																												
Baetis sp.																												
Baetis tricaudatus group																											1	
| Family: Ephemerellidae								6		2	4																	
Drunella doddsii																												
Drunella grandis group																											1	
Ephemerella sp.							1		1	1																		
| Family: Ephemeridae																												
Ephemera simulans																												
| Family: Heptageniidae																												
Heptagenia sp.																												
| Family: Leptohyphidae																												
Tricorythodes sp.								1																				
| Family: Leptophlebiidae																												
Paraleptophlebia sp.																												
| Order: Plecoptera																												
| Family: Chloroperlidae																												
Suwallia sp.																												
Sweltsa sp.																												
| Family: Perlodidae																												
Isoperla sp.																												
Skwala sp.																												
| Family: Taeniopterygidae																												
Taenionema sp.																												
| Order: Trichoptera																												
| Family: Apataniidae																												
Apatania sp.																												
| Family: Brachycentridae																												
Brachycentrus occidentalis									1							1			1									
| Family: Glossosomatidae																												
Glossosoma sp.																												
Protoptila sp.																												
| Family: Hydropsychidae																												
Cheumatopsyche sp.																												
Hydropsyche sp.				1																							1	
| Family: Lepidostomatidae																												
Lepidostoma sp.																												
| Family: Leptoceridae									1	5																		
Ceraclea sp.	7							1		1				2	1	2			1						1			
Mystacides sp.								11	2	6	7																1	
Triaenodes sp.																												
| Family: Limnephilidae																												
Dicosmoecus sp.																												
| Family: Polycentropodidae																												
Polycentropus sp.																												
| Family: Psychomyiidae																												
Psychomyia sp.																												
| Order: Coleoptera																												
| Family: Dytiscidae																												
Oreodytes sp.									1																		2	
| Family: Elmidae																												
Cleptelmis sp.																												
Dubiraphia sp.																												
Heterlimnius sp.																												
Narpus sp.																												
Optioservus sp.																												
Zaitzevia sp.								1																				
| Order: Diptera																												
| Family: Ceratopogonidae																												
Culicoides sp.																												
Probezzia sp.							1		1																			
| Family: Chironomidae			1																									
| Subfamily: Chironominae																												
| Tribe: Chironomini																												
Chironomus sp.													7	8	9	23	8	25	134	230	51	7		4	4			
Cryptochironomus sp.													1	6	2	2	5	4		2	2						4	3
Dicrotendipes sp.																		9										
Microtendipes pedellus							125	120	135	165	160					4	31	21			2					4	23	1
Paracladopelma sp.																												
Paralauterborniella nigrohalteris																												
Phaenopsectra sp.					1		20	13	8	6		5	4	36	6	19		17		6			1					
Polypedilum sp.	7											20					7		5	2		9	2		11	7	4	
Robackia demeijerei					1							1											2	22	6			
| Tribe: Tanytarsini																												
Micropsectra sp.													6	13	12	9	14	15										
Paratanytarsus sp.														6														
Rheotanytarsus sp.																												
Tanytarsus sp.							67	45	38	40	37	13							3			2	1		5	7	8	
| Subfamily: Diamesinae																												
| Tribe: Diamesini																												
Pagastia sp.																												
Potthastia longimana group																												
| Subfamily: Orthocladiinae																												
Eukiefferiella sp.																												
Orthocladius complex				4																					1	3		
Parakiefferiella sp.							3	11	6	5	8	4																
Synorthocladius sp.																												
Tvetenia sp.																												
| Subfamily: Prodiamesinae																												
Monodiamesa sp.							5	6	8	12	6	1				2	3							5		2		3

Site:	DEP-REF-2	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-5	DEP-EXP-5
Sample:	Sweep	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2
CC#:	CC131273	CC131274	CC131275	CC131276	CC131277	CC131278	CC131279	CC131280	CC131281	CC131282	CC131283	CC131284	CC131285	CC131286	CC131287	CC131288	CC131289	CC131290	CC131291	CC131292	CC131293	CC131294	CC131295	CC131296	CC131297	CC131298	CC131299	CC131300
| **Subfamily: Tanypodinae**		0		0		0		0		0		0		0		0		0		0		0		0	1	0		0
Guttipelopia guttipennis		0		0		0		0		0		0		0		0		0		0		0		0		0		0

Site:	DEP-REF-2	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-5	DEP-EXP-5
Sample:	Sweep	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2
CC#:	CC131273	CC131274	CC131275	CC131276	CC131277	CC131278	CC131279	CC131280	CC131281	CC131282	CC131283	CC131284	CC131285	CC131286	CC131287	CC131288	CC131289	CC131290	CC131291	CC131292	CC131293	CC131294	CC131295	CC131296	CC131297	CC131298	CC131299	CC131300
| Tribe: Pentaneurini																												
Thienemannimyia group							2																					
| Tribe: Procladiini																												
Procladius sp.																											2	2
| Family: Empididae																												
Hemerodromia sp.									1	1																		
| Family: Psychodidae																												
Pericoma sp.																												
| Family: Simuliidae																												
Simulium sp.																												
| Family: Tabanidae																												
| Family: Tipulidae																												
Antocha sp.																												
| Order: Hemiptera																												
| Family: Corixidae									5				2	2	4	4			1									3
Callicorixa sp.	4								1	1				2						2	13	9	1			1		1
Sigara sp.																	1											
| Order: Odonata																												
| Family: Gomphidae							1										1											
Subphylum: Crustacea																												
| Class: Malacostraca																												
| Order: Amphipoda	174																											
| Family: Crangonyctidae																												
Crangonyx sp.	522					1												1						1				
| Family: Gammaridae																												
Gammarus sp.																												
| Family: Hyalellidae																												
Hyalella sp.	4																											
| Order: Decapoda																												
| Family: Astacidae																												
Pacifastacus sp.																												
| Order: Isopoda																												
| Family: Asellidae																												
Lirceus sp.	144																											
Subphylum: Chelicerata																												
| Class: Arachnida											1																	
| Order: Trombidiformes																												
| Family: Hydryphantidae																												
Protzia sp.																												
| Family: Hygrobatidae																												
Atractides sp.																												
Hygrobates sp.								1							1								1					
| Family: Lebertiidae																												
Lebertia sp.			1				3	2	2														1	2		2	4	1
| Family: Sperchontidae																												
Sperchon sp.																												
| Family: Torrenticolidae																												
Torrenticola sp.																												
Phylum: Mollusca																												
| Class: Bivalvia																												
| Order: Veneroida																												
| Family: Pisidiidae																												
| Family: Unionoida																												
| Family: Margaritiferidae																												
Margaritifera falcata																								1				
Pisidium sp.	48						3	1	1	1	2	2	3	8	3	6	3	7	17	7		9	9	10	6	11	29	27
Sphaerium sp.																												
| Class: Gastropoda	7																		1									
| Order: Basommatophora																												
| Family: Lymnaeidae																												
Fisherola nuttalli																												
Lymnaea sp.	4		1													1			2			4					2	2
| Family: Physidae																												
Physa sp.	30		1				1	3		2	1													2		4	6	1
| Family: Planorbidae																												
Gyraulus sp.	30							3														1					1	
Helisoma sp.	4																											
Menetus opercularis	115																											
| Order: Heterostropha																												
| Family: Valvatidae																												
Valvata sincera							2	2	1	5				1	2													
Valvata sp.																												
Valvata tricarinata	4								1																	1		
| Order: Hypsogastropoda																												
| Family: Lithoglyptidae																												
Fluminicola sp.			14	8	16							2	1		1	4	1						2	7	2	13		1
Phylum: Annelida																												
Subphylum: Clitellata																												
| Class: Hirudinea								1																				
| Order: Arhynchobdellida																												
| Family: Erpobdellidae	44																											
| Order: Rhynchobdellida																												
| Family: Glossiphoniidae																												
| Class: Oligochaeta	4															1			3									
| Order: Lumbriculida																												
| Family: Lumbriculidae							13		4		24	1				2												
Rhynchelmis sp.														1														
| Order: Tubificida																												
| Family: Enchytraeidae																												
Enchytraeus							1																					
| Family: Lumbricidae																												
| Family: Naididae							9	6	1	40	8	1						1	114	55	1	21	11	8	6	6	40	74
Nais sp.	11						8	8	4	16				2	1	2												
Pristina sp.																												
Phylum: Cnidaria																												
| Class: Hydrozoa																												

Site:	DEP-REF-2	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-REF-3	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-1	DEP-EXP-2	DEP-EXP-2	DEP-EXP-2
Sample:	Sweep	1	2	3	4	5	1	2	3	4	5	1	2	3
CC#:	CC131273	CC131274	CC131275	CC131276	CC131277	CC131278	CC131279	CC131280	CC131281	CC131282	CC131283	CC131284	CC131285	CC131286
| Order: Anthoathecatae		0		0		0		0		0		0		0
| Family: Hydridae		0		0		0		0		0		0		0
Hydra sp.		0		0		0		0		0		0		0
Totals:	**1163**	**0**	**18**	**13**	**18**	**1**	**265**	**242**	**223**	**309**	**258**	**50**	**24**	**87**

Site:	DEP-EXP-2	DEP-EXP-2	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-3	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-4	DEP-EXP-5	DEP-EXP-5
Sample:	4	5	1	2	3	4	5	1	2	3	4	5	1	2
CC#:	CC131287	CC131288	CC131289	CC131290	CC131291	CC131292	CC131293	CC131294	CC131295	CC131296	CC131297	CC131298	CC131299	CC131300
| Order: Anthoathecatae		0		0		0		0		0		0		0
| Family: Hydridae		0		0		0		0		0		0		0
Hydra sp.		0		0		0		0		0		0		0
Totals:	**42**	**82**	**74**	**100**	**282**	**304**	**69**	**62**	**31**	**62**	**43**	**61**	**129**	**119**

Taxa present but not included:
Copepoda
Daphnia sp.
Nemata
No Invertebrates Found
Ostracoda
Turbellaria

Cordillera Consulting

Project: Teck 12-976
Ecoscape
Taxonomist: Sue Salter
suesalter@shaw.ca
250-494-7553

Site:	DEP-EXP-5	DEP-EXP-5	DEP-EXP-5	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7
Sample:	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131301	CC131302	CC131303	CC131304	CC131305	CC131306	CC131307	CC131308	CC131309	CC131310	CC131311	CC131312	CC131313
Phylum: Arthropoda		0		0		0		0		0		0	
Subphylum: Hexapoda		0		0		0		0		0		0	
| Class: Insecta		0		0		0		0		0		0	
| Order: Ephemeroptera		0		0		0		0		0		0	
| Family: Ameletidae		0		0		0		0		0		0	
Ameletus		0		0		0		0		0		0	
| Family: Baetidae		0		0		0		0		0		0	
Acentrella sp.		0		0		0		0		0		0	
Baetis sp.		0		0		0		0		0		0	
Baetis tricaudatus group		0		0		0		0		0		0	
| Family: Ephemerellidae		0		0		0		0		0		0	
Drunella doddsii		0		0		0		0		0		0	
Drunella grandis group		0		0		0		0		0		0	
Ephemerella sp.		0		0		0		0		0		0	
| Family: Ephemeridae		0		0		0		0		0		0	
Ephemera simulans		0		0		0		0		0		0	
| Family: Heptageniidae		0		0		0		0		0		0	
Heptagenia sp.		0		0		0		0		0		0	
| Family: Leptohyphidae		0		0		0		0		0		0	
Tricorythodes sp.		0		0		0		0		0		0	
| Family: Leptophlebiidae		0		0		0		0		0		0	
Paraleptophlebia sp.		0		0		0		0		0		0	
		0		0		0		0		0		0	
| Order: Plecoptera		0		0		0		0		0		0	
| Family: Chloroperlidae		0		0		0		0		0		0	
Suwallia sp.		0		0		0		0		0		0	
Sweltsa sp.		0		0		0		0		0		0	
| Family: Perlodidae		0		1		0		0		0		0	
Isoperla sp.		0		0		0		0		0		0	
Skwala sp.		0		0		0		0		0		0	
| Family: Taeniopterygidae		0		0		0		0		0		0	
Taenionema sp.		0		0		0		0		0		0	
		0		0		0		0		0		0	
| Order: Trichoptera		0		0		0		0		0		0	
| Family: Apataniidae		0		0		0		0		0		0	
Apatania sp.		0		0		0		0		0		0	
| Family: Brachycentridae		0		0		0		0		0		0	
Brachycentrus occidentalis		0		0		0		0		0		0	
| Family: Glossosomatidae		0		0		0		0		0		0	
Glossosoma sp.		0		0		0		0		0		0	
Protoptila sp.		0		0		0		0		0		0	
| Family: Hydropsychidae		0		0		1		0	4	0		5	
Cheumatopsyche sp.		0		0		0		0	1	0		0	
Hydropsyche sp.		0		0		0		0	7	0		0	
| Family: Lepidostomatidae		0		0		0		0		0		0	
Lepidostoma sp.		0		0		0		0		0		0	
| Family: Leptoceridae		0		0		0		0		0		0	
Ceraclea sp.		0		0		1		0		0		15	
Mystacides sp.		0		0		0		0	2	0		0	
Triaenodes sp.		0		0		0		0		0		0	
| Family: Limnephilidae		0		0		0		0		0		0	
Dicosmoecus sp.		0		0		0		0		0		0	
| Family: Polycentropodidae		0		0		0		0		0		0	
Polycentropus sp.		0		0		0		0		0		0	
| Family: Psychomyiidae		0		0		0		0		0		0	
Psychomyia sp.		0		0		0		0		0		0	
		0		0		0		0		0		0	
| Order: Coleoptera		0		0		0		0		0		0	
| Family: Dytiscidae		0		0		0		0		0		0	
Oreodytes sp.		0		0		0		0		0		0	
| Family: Elmidae		0		0		0		0		0		0	
Cleptelmis sp.		0		0		0		0		0		0	
Dubiraphia sp.		0		0		0		0		0		0	
Heterlimnius sp.		0		0		0		0		0		0	
Narpus sp.		0		0		0		0		0		0	
Optioservus sp.		0		0		0		0		0		0	
Zaitzevia sp.		0		0		0		0		0		0	
		0		0		0		0		0		0	
| Order: Diptera		0		0		0		0		0		0	
| Family: Ceratopogonidae		0		0		0		0		0		0	
Culicoides sp.		0		0		0		0		0		0	
Probezzia sp.		1	1	0		0	1	2	1	1		0	
| Family: Chironomidae		0		0		0		0		0		0	
| Subfamily: Chironominae		0		0		0		0		0		0	
| Tribe: Chironomini		0		0		0		0		0		0	
Chironomus sp.		0		0		0		0		0		0	
Cryptochironomus sp.	1	0	2	4	1	3	7	2	6	5		25	1
Dicrotendipes sp.		0		0		0		0		0		0	
Microtendipes pedellus		0	1	0	1	0		1		0		0	
Paracladopelma sp.		0		0		0		0		0		0	
Paralauterborniella nigrohalteris		0		0		0		0		0		0	
Phaenopsectra sp.	2	0		0		0		0		0		0	
Polypedilum sp.	3	0	4	0	1	0	1	1	5	11		5	1
Robackia demeijerei		0		2		0		0		0		0	
| Tribe: Tanytarsini		0		0		0		0		0		0	
Micropsectra sp.		0		0		0		0		0		0	
Paratanytarsus sp.		0		0		0		0		0		0	
Rheotanytarsus sp.		0		0		0		0		0		0	
Tanytarsus sp.		0		0		0		0		0		0	
| Subfamily: Diamesinae		0		0		0		0		0		0	
| Tribe: Diamesini		0		0		0		0		0		0	
Pagastia sp.		0		0		0		0		0		0	
Potthastia longimana group		0		0		0		1		0		0	
| Subfamily: Orthocladiinae		0		0		0		0		0	1	0	1
Eukiefferiella sp.		0		0		0		0		0		0	
Orthocladius complex		0		0		0		0		0		0	
Parakiefferiella sp.		0		0		0		0		0		0	
Synorthocladius sp.		0		0		0		0		0		0	
Tvetenia sp.		0		0		0		0		0		0	
| Subfamily: Prodiamesinae		0		0		0		0		0		0	
Monodiamesa sp.		0		0	1	0	2	2		0		0	

Site:	DEP-EXP-5	DEP-EXP-5	DEP-EXP-5	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7
Sample:	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131301	CC131302	CC131303	CC131304	CC131305	CC131306	CC131307	CC131308	CC131309	CC131310	CC131311	CC131312	CC131313
| **Subfamily: Tanypodinae**		0		0		0		0		0		0	
Guttipelopia guttipennis		0		0		0		0		0		0	

Site:	DEP-EXP-5	DEP-EXP-5	DEP-EXP-5	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7
Sample:	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131301	CC131302	CC131303	CC131304	CC131305	CC131306	CC131307	CC131308	CC131309	CC131310	CC131311	CC131312	CC131313
| Tribe: Pentaneurini													
Thienemannimyia group													
| Tribe: Procladiini													
Procladius sp.					1							5	
| Family: Empididae													
Hemerodromia sp.													
| Family: Psychodidae													
Pericoma sp.													
| Family: Simuliidae													
Simulium sp.													1
| Family: Tabanidae													
| Family: Tipulidae													
Antocha sp.													
| Order: Hemiptera													
| Family: Corixidae					1							5	
Callicorixa sp.	1									3	4	5	
Sigara sp.													
| Order: Odonata													
| Family: Gomphidae													
Subphylum: Crustacea									2				
| Class: Malacostraca													
| Order: Amphipoda			1	10	29	134	50	182		1			
| Family: Crangonyctidae													
Crangonyx sp.	1		2		9	224	122	52					
| Family: Gammaridae													
Gammarus sp.												5	
| Family: Hyalellidae													
Hyalella sp.						10		20					
| Order: Decapoda													
| Family: Astacidae													
Pacifastacus sp.													
| Order: Isopoda													
| Family: Asellidae													
Lirceus sp.				1		5	5	3		17	5	1365	
Subphylum: Chelicerata													
| Class: Arachnida													
| Order: Trombidiformes													
| Family: Hydryphantidae													
Protzia sp.													
| Family: Hygrobatidae													
Atractides sp.													
Hygrobates sp.												5	
| Family: Lebertiidae													
Lebertia sp.					1								
| Family: Sperchontidae													
Sperchon sp.													
| Family: Torrenticolidae													
Torrenticola sp.													
Phylum: Mollusca													
| Class: Bivalvia													
| Order: Veneroida													
| Family: Pisidiidae													
| Family: Unionoida													
| Family: Margaritiferidae													
Margaritifera falcata													
Pisidium sp.	19	20	46	56	12	18	47	13	99	33	1	115	1
Sphaerium sp.													
| Class: Gastropoda					2			1					
| Order: Basommatophora													
| Family: Lymnaeidae													
Fisherola nuttalli													
Lymnaea sp.	1				6	7	3	6				5	
| Family: Physidae													
Physa sp.					4	6	1	1				20	
| Family: Planorbidae													
Gyraulus sp.				1	1	8		8					
Helisoma sp.													
Menetus opercularis					21	12							
| Order: Heterostropha													
| Family: Valvatidae													
Valvata sincera													
Valvata sp.													
Valvata tricarinata	1												
| Order: Hypsogastropoda													
| Family: Lithoglyptidae													
Fluminicola sp.				1	1				1		1	5	1
Phylum: Annelida													
Subphylum: Clitellata													
| Class: Hirudinea	1												
| Order: Arhynchobdellida													
| Family: Erpobdellidae				1			1						
| Order: Rhynchobdellida													
| Family: Glossiphoniidae													
| Class: Oligochaeta													
| Order: Lumbriculida													
| Family: Lumbriculidae									1	1		20	
Rhynchelmis sp.			1	6	1		2		2				
| Order: Tubificida													
| Family: Enchytraeidae													
Enchytraeus					2								
| Family: Lumbricidae	1					1							
| Family: Naididae	70	45	21	99	7	51	50	37	23	35	49	20	32
Nais sp.													
Pristina sp.													
Phylum: Cnidaria													
| Class: Hydrozoa													

Site:	DEP-EXP-5	DEP-EXP-5	DEP-EXP-5	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-6	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7	DEP-EXP-7
Sample:	3	4	5	1	2	3	4	5	1	2	3	4	5
CC#:	CC131301	CC131302	CC131303	CC131304	CC131305	CC131306	CC131307	CC131308	CC131309	CC131310	CC131311	CC131312	CC131313
| Order: Anthoathecatae		0		0		0		0		0		0	
| Family: Hydridae		0		0		0		0		0		0	
Hydra sp.		0		0		0		0		0		0	
Totals:	**101**	**66**	**79**	**182**	**102**	**481**	**292**	**332**	**154**	**107**	**61**	**1625**	**38**

Taxa present but not included:
Copepoda
Daphnia sp.
Nemata
No Invertebrates Found
Ostracoda
Turbellaria

APPENDIX G

LARGE BODIED FISH DATA

Large Body Fish Data

SampleN	Tag Number	Site Name	River Section	Upstream UTM East	Upstream UTM North	Downstream UTM East	Downstream UTM North	Bank	Phase	Date	Time	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	Tag Colour/Type
776	52866	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	217	233	141	Blue
776G	52866	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	217	233	141	Blue
1783	52392	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	17-Oct-12	19:45	MW	222	242	164	Blue
1783G	52392	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	17-Oct-12	19:45	MW	222	242	164	Blue
775	52865	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	248	264	211	Blue
819	52873	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	4-Oct-12	0:44	MW	288	316	358	Blue
218	51798	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	MW	292	318	292	Blue
218G	51798	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	MW	292	318	292	Blue
1277	52364	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	10-Oct-12	21:15	MW	300	320	368	Blue
1277G	52364	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	10-Oct-12	21:15	MW	300	320	368	Blue
832	52874	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	4-Oct-12	0:44	MW	305	329	340	Blue
832G	52874	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	4-Oct-12	0:44	MW	305	329	340	Blue
771	52864	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	388	418	949	Blue
771G	52864	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	388	418	949	Blue
1792	52394	C49.0-L	Columbia Lower	455121	5434301	455204	5433379	RUB	12	17-Oct-12	21:16	MW	392	427	960	Blue
793	52870	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	MW	396	424	1034	Blue
190	51793	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	26-Sep-12	21:44	MW	397	429	852	Blue
1323	52370	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	11-Oct-12	1:49	MW	401	421	807	Blue
221	52850	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	MW	403	436	970	Blue
221G	52850	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	MW	403	436	970	Blue
1258	52360	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	10-Oct-12	20:24	MW	412	434	1177	Blue
220	51799	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	MW	423	456	1084	Blue
223	52851	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	MW	425	463	708	Blue
223G	52851	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	MW	425	463	708	Blue
1793	52395	C49.0-L	Columbia Lower	455121	5434301	455204	5433379	RUB	12	17-Oct-12	21:16	MW	435	465	907	Blue
1793G	52395	C49.0-L	Columbia Lower	455121	5434301	455204	5433379	RUB	12	17-Oct-12	21:16	MW	435	465	907	Blue
1791	52393	C49.0-L	Columbia Lower	455121	5434301	455204	5433379	RUB	12	17-Oct-12	21:16	MW	438	468	1168	Blue
1320	52369	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	11-Oct-12	1:49	MW	459	491	1300	Blue
1320G	52369	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	11-Oct-12	1:49	MW	459	491	1300	Blue
1284	52366	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	10-Oct-12	22:56	MW	474	507	1729	Blue
884	52883	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	4-Oct-12	22:54	RB	252	269	205	Blue
884G	52883	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	4-Oct-12	22:54	RB	252	269	205	Blue
1870	52502	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	18-Oct-12	19:35	RB	280	300	263	Blue
205	51796	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	RB	290	305	330	Blue
841	52875	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	4-Oct-12	19:46	RB	295	311	274	Blue
204	51795	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	RB	311	334	417	Blue
204G	51795	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	RB	311	334	417	Blue
1864	52501	C53.6-L	Columbia Lower	455898	5429799	NA	NA	RUB	12	18-Oct-12	2:40	RB	336	358	477	Blue
1862	52500	C53.6-L	Columbia Lower	455898	5429799	NA	NA	RUB	12	18-Oct-12	2:40	RB	371	389	562	Blue
1861	52399	C53.6-L	Columbia Lower	455898	5429799	NA	NA	RUB	12	18-Oct-12	2:40	RB	380	406	651	Blue
1861G	52399	C53.6-L	Columbia Lower	455898	5429799	NA	NA	RUB	12	18-Oct-12	2:40	RB	380	406	651	Blue
1275	52362	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	10-Oct-12	21:15	RB	400	419	739	Blue
187	51792	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	26-Sep-12	21:44	RB	409	435	738	Blue
187G	51792	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	26-Sep-12	21:44	RB	409	435	738	Blue
1368	52372	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	RB	424	448	941	Blue
1368G	52372	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	RB	424	448	941	Blue
212	51797	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	RB	427	458	933	Blue
1265	52361	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	10-Oct-12	20:24	RB	431	460	903	Blue
1265G	52361	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	10-Oct-12	20:24	RB	431	460	903	Blue
847	52876	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	4-Oct-12	19:46	RB	438	463	997	Blue
847G	52876	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	4-Oct-12	19:46	RB	438	463	997	Blue
778	52867	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	RB	462	476	1287	Blue
1371	52373	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	RB	472	502	1388	Blue
1371G	52373	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	RB	472	502	1388	Blue
1289	52368	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	10-Oct-12	22:56	RB	482	507	1379	Blue
1289G	52368	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	10-Oct-12	22:56	RB	482	507	1379	Blue
791	52869	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	RB	485	500	1429	Blue
201	51794	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	26-Sep-12	22:56	RB	496	518	1295	Blue
1286	52367	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	10-Oct-12	22:56	WP	313	334	276	Blue
1286G	52367	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	10-Oct-12	22:56	WP	313	334	276	Blue
796	52871	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	WP	326	340	342	Blue
240	52853	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	327	347	344	Blue
241	52854	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	330	347	354	Blue
241G	52854	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	330	347	354	Blue
1855	52398	C53.6-L	Columbia Lower	455898	5429799	NA	NA	RUB	12	18-Oct-12	2:40	WP	340	363	378	Blue
1357	52371	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	WP	343	365	381	Blue
1395	52375	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	11-Oct-12	23:00	WP	345	360	405	Blue
1395G	52375	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	11-Oct-12	23:00	WP	345	360	405	Blue
883	52899	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	4-Oct-12	22:54	WP	345	364	418	Blue
883G	52899	C49.8-L	Columbia Lower	455204	5433379	455385	5431291	RUB	12	4-Oct-12	22:54	WP	345	364	418	Blue
784	52868	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	3-Oct-12	22:12	WP	346	371	399	Blue
242	52855	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	364	384	427	Blue
242G	52855	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	364	384	427	Blue
1886	52504	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	18-Oct-12	22:02	WP	370	397	696	Blue
1886G	52504	C49.8-R	Columbia Lower	454993	5433410	454976	5431377	LUB	12	18-Oct-12	22:02	WP	370	397	696	Blue
850	52878	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	4-Oct-12	19:46	WP	371	393	570	Blue
850G	52878	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	4-Oct-12	19:46	WP	371	393	570	Blue
817	52872	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	4-Oct-12	0:44	WP	377	398	555	Blue
1839	52396	C52.8-L	Columbia Lower	455888	5430887	455898	5429799	RUB	12	18-Oct-12	1:41	WP	380	403	607	Blue
239	52852	C52.2-R	Columbia Lower	455350	5431088	454287	5428238	LUB	12	27-Sep-12	1:25	WP	381	398	592	Blue
1873	52503	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	18-Oct-12	19:35	WP	396	422	700	Blue
1873G	52503	C48.2-R	Columbia Lower	455021	5434885	455177	5434013	LUB	12	18-Oct-12	19:35	WP	396	422	700	Blue
1279	52365	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	10-Oct-12	21:15	WP	422	448	790	Blue
1373	52374	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	WP	426	450	821	Blue
1373G	52374	C47.8-L	Columbia Lower	455317	5435244	455121	5434301	RUB	12	11-Oct-12	20:28	WP	426	450	821	Blue
186	51791	C49.0-R	Columbia Lower	455177	5434013	454993	5433410	LUB	12	26-Sep-12	21:44	WP	440	464	942	Blue
1840	52397	C52.8-L	Columbia Lower	455888	5430887	455898	5429799	RUB	12	18-Oct-12	1:41	WP	598	633	3143	Blue
1840G	52397	C52.8-L	Columbia Lower	455888	5430887	455898	5429799	RUB	12	18-Oct-12	1:41	WP	598	633	3143	Blue
565	52856	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	MW	181	197	71	Blue
565G	52856	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	MW	181	197	71	Blue
955	52889	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	MW	196	212	90	Blue
955G	52889	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	MW	196	212	90	Blue
1132	52356	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	MW	198	219	102	Blue
1132G	52356	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	MW	198	219	102	Blue

Large Body Fish Data

SampleN	Tag Number	Site Name	River Section	Upstream UTM East	Upstream UTM North	Downstream UTM East	Downstream UTM North	Bank	Phase	Date	Time	Species	Fork Length (mm)	Total Length (mm)	Weight (g)	Tag Colour/Type
950	52886	C00.0-R	Columbia Upper	443996	5465466	444649	5465448	LUB	12	5-Oct-12	20:08	MW	289	310	351	Blue
2136	52519	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	22-Oct-12	1:44	MW	300	327	388	Blue
1114	52351	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	MW	304	329	369	Blue
1114G	52351	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	MW	304	329	369	Blue
1130	52355	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	MW	304	329	384	Blue
1130G	52355	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	MW	304	329	384	Blue
1567	52389	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	324	345	508	Blue
1977	52512	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	MW	326	353	491	Blue
1977G	52512	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	MW	326	353	491	Blue
1564	52387	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	330	362	589	Blue
2137	52520	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	22-Oct-12	1:44	MW	338	367	600	Blue
1129	52354	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	MW	349	375	672	Blue
1558	52384	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	369	393	774	Blue
1111	52350	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	MW	370	391	735	Blue
1111G	52350	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	MW	370	391	735	Blue
1953	52505	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	MW	377	400	693	Blue
1953G	52505	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	MW	377	400	693	Blue
1565	52388	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	378	406	790	Blue
1565G	52388	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	378	406	790	Blue
582	52862	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	MW	384	411	761	Blue
2135	52518	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	22-Oct-12	1:44	MW	390	419	769	Blue
2135G	52518	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	22-Oct-12	1:44	MW	390	419	769	Blue
1560	52385	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	MW	395	421	825	Blue
2127	52517	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	22-Oct-12	0:45	MW	395	420	680	Blue
566	52857	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	RB	227	243	132	Blue
566G	52857	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	RB	227	243	132	Blue
1021	52894	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	6-Oct-12	1:59	RB	246	267	191	Blue
1021G	52894	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	6-Oct-12	1:59	RB	246	267	191	Blue
1122	52353	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	RB	257	269	207	Blue
1122G	52353	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	RB	257	269	207	Blue
1502	52382	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	12-Oct-12	21:55	RB	316	339	341	Blue
579	52861	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	RB	320	337	360	Blue
1975	52511	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	332	356	423	Blue
1975G	52511	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	332	356	423	Blue
1954	52506	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	RB	355	381	486	Blue
1954G	52506	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	RB	355	381	486	Blue
1140	52357	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	RB	360	379	542	Blue
1140G	52357	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	7-Oct-12	2:02	RB	360	379	542	Blue
588	52863	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	RB	361	380	535	Blue
1571	52390	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	RB	366	393	502	Blue
954	52888	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	RB	373	397	553	Blue
1982	52513	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	376	398	524	Blue
1982G	52513	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	376	398	524	Blue
1563	52386	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	RB	379	402	572	Blue
1116	52352	C07.3-R	Columbia Upper	450808	5464265	452366	5464096	LUB	12	7-Oct-12	0:59	RB	389	412	630	Blue
998	52896	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	RB	444	265	835	Blue
998G	52896	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	RB	444	265	835	Blue
1573	52391	C07.4-L	Columbia Upper	450892	5464632	451742	5464481	RUB	12	13-Oct-12	20:24	RB	450	477	946	Blue
1974	52509	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	479	503	1078	Blue
935	52884	C00.0-R	Columbia Upper	443996	5465466	444649	5465448	LUB	12	5-Oct-12	20:08	RB	486	515	1230	Blue
935G	52884	C00.0-R	Columbia Upper	443996	5465466	444649	5465448	LUB	12	5-Oct-12	20:08	RB	486	515	1230	Blue
1475	52378	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	12-Oct-12	20:37	RB	493	511	1160	Blue
1475G	52378	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	12-Oct-12	20:37	RB	493	511	1160	Blue
1988	52514	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	RB	530	553	1475	Blue
956	52890	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	RB	534	562	1824	Blue
1955	52507	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	WP	321	341	416	Blue
1955G	52507	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	WP	321	341	416	Blue
1465	52377	C00.0-R	Columbia Upper	443996	5465466	444649	5465448	LUB	12	12-Oct-12	19:48	WP	328	352	367	Blue
1153	52358	C05.6-L	Columbia Upper	449206	5464833	450212	5464594	RUB	12	7-Oct-12	4:12	WP	333	352	407	Blue
1153G	52358	C05.6-L	Columbia Upper	449206	5464833	450212	5464594	RUB	12	7-Oct-12	4:12	WP	333	352	407	Blue
986	52897	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	336	356	468	Blue
986G	52897	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	336	356	468	Blue
1482	52380	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	12-Oct-12	21:55	WP	339	363	428	Blue
953	52887	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	WP	340	362	350	Blue
953G	52887	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	5-Oct-12	21:38	WP	340	362	350	Blue
1956	52508	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	20-Oct-12	20:20	WP	343	370	386	Blue
575	52860	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	WP	355	371	475	Blue
971	52892	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	367	387	516	Blue
567	52858	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	WP	371	398	536	Blue
567G	52858	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	30-Sep-12	2:46	WP	371	398	536	Blue
1154	52359	C05.6-L	Columbia Upper	449206	5464833	450212	5464594	RUB	12	7-Oct-12	4:12	WP	372	389	609	Blue
1486	52381	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	12-Oct-12	21:55	WP	391	417	628	Blue
1991	52516	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	WP	392	421	613	Blue
973	52893	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	393	420	594	Blue
973G	52893	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	393	420	594	Blue
1990	52515	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	WP	416	443	762	Blue
1990G	52515	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	20-Oct-12	21:47	WP	416	443	762	Blue
969	52891	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	480	503	1198	Blue
969G	52891	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	480	503	1198	Blue
1458	52376	C00.0-R	Columbia Upper	443996	5465466	444649	5465448	LUB	12	12-Oct-12	19:48	WP	481	512	1419	Blue
976	52894	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	527	560	1760	Blue
976G	52894	C01.3-L	Columbia Upper	445015	5465719	446504	5465652	RUB	12	5-Oct-12	23:07	WP	527	560	1760	Blue
1478	52379	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	12-Oct-12	20:37	WP	558	584	2129	Blue
1478G	52379	C00.7-L	Columbia Upper	444387	5465734	445015	5465719	RUB	12	12-Oct-12	20:37	WP	558	584	2129	Blue
1516	52383	C03.6-L	Columbia Upper	447294	5465482	449206	5464833	RUB	12	13-Oct-12	0:54	WP	633	677	3700	Blue

Large Body Fish Data

SampleN	Tag Number	Comments	Sex	otolith Taken	Age (yrs)	Condition (k)	Comments/Internal Parasites/Abnormalities	Tissue Analysed	% Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron
776	52866		M	Y	1+	1.114682928	immature	Whole	72.3	<0.4	0.003	0.057	0.43	<0.002	<0.02	<0.1
776G	52866		M	Y	1+	1.114682928	immature	Gut	60.9	288	0.381	0.44	23	0.019	0.03	0.2
1783	52392		U	Y	1+	1.157171557	Immature	Whole	70.8	<0.4	0.004	0.045	0.59	<0.002	<0.02	<0.1
1783G	52392		U	Y	1+	1.157171557	Immature	Gut	80	147	0.188	0.389	6.08	0.009	<0.02	0.1
775	52865		M	Y	1+	1.146755085	immature	Fillet	73.6	<0.4	0.003	0.037	0.06	<0.002	<0.02	<0.1
819	52873	floy scar? Hemmorage fins	M	Y	2+	1.134545137		Fillet	69.9	<0.4	0.003	0.065	0.12	<0.002	<0.02	<0.1
218	51798		M	Y	2+	0.908032706		Whole	69.1	<0.4	0.007	0.077	0.44	<0.002	<0.02	<0.1
218G	51798		M	Y	2+	0.908032706		Gut	53.1	242	0.268	0.409	12.3	0.012	<0.02	0.1
1277	52364	lavage/bonk	F	Y	2+	1.123046875	immature	Whole	68.2	<0.4	0.004	0.063	0.2	<0.002	<0.02	<0.1
1277G	52364	lavage/bonk	F	Y	2+	1.123046875	immature	Gut	60.3	6.3	0.031	0.116	0.22	<0.002	<0.02	<0.1
832	52874		M	Y	2+	0.954753421		Whole	68.9	0.6	<0.002	0.039	0.36	<0.002	<0.02	<0.1
832G	52874		M	Y	2+	0.954753421		Gut	58.6	<0.4	0.002	0.266	<0.01	<0.002	<0.02	<0.1
771	52864		F	Y	4+	1.299383558		Whole	64.2	0.7	0.014	0.073	0.33	<0.002	<0.02	<0.1
771G	52864		F	Y	4+	1.299383558		Gut	62.9	56.1	0.116	0.118	2.25	0.003	<0.02	0.1
1792	52394		M	Y	5+	1.233069649		Fillet	66.7	<0.4	0.005	0.076	0.08	<0.002	<0.02	<0.1
793	52870		F	Y	4+	1.356509904		Fillet	65.6	<0.4	0.005	0.074	0.03	<0.002	<0.02	<0.1
190	51793	hem caud	M	Y	7+	1.079114972		Fillet	66.5	0.7	0.006	0.059	0.18	<0.002	<0.02	<0.1
1323	52370		F	Y	6+	1.081501802		Fillet	69.2	0.5	0.007	0.056	0.26	<0.002	<0.02	<0.1
221	52850		M	Y	6+	1.170340587		Whole	62.7	0.5	0.01	0.077	0.3	<0.002	<0.02	<0.1
221G	52850		M	Y	6+	1.170340587		Gut	71.6	60.2	0.228	0.079	2.3	0.003	<0.02	0.1
1258	52360		F	Y	8+	1.439816925	Gravid	Fillet	71.2	0.5	0.008	0.047	0.21	<0.002	<0.02	<0.1
220	51799		F	Y	5+	1.143233006	mature	Fillet	69.5	0.7	0.009	0.045	0.26	<0.002	<0.02	<0.1
223	52851		F	Y	7+	0.713329664	skinny, minimal visceral fat	Whole	72.7	1.7	0.018	0.056	0.93	<0.002	<0.02	<0.1
223G	52851		F	Y	7+	0.713329664	skinny, minimal visceral fat	Gut	75.1	2.1	0.015	0.06	0.02	<0.002	<0.02	<0.1
1793	52395		M	Y	9+	0.902087009	tumor (40mm dia) on right gonad, gonads pale greyish	Whole	72.3	0.6	0.005	0.023	0.23	<0.002	<0.02	<0.1
1793G	52395		M	Y	9+	0.902087009	tumor (40mm dia) on right gonad, gonads pale greyish	Gut	80.3	7.8	0.012	0.013	0.08	<0.002	<0.02	<0.1
1791	52393		F	Y	9+	1.139476265	Gravid	Fillet	69.7	<0.4	0.005	0.046	0.11	<0.002	<0.02	<0.1
1320	52369		F	Y	10+	1.098244093	Gravid	Whole	62	0.5	0.005	0.063	0.1	<0.002	<0.02	<0.1
1320G	52369		F	Y	10+	1.098244093	Gravid	Gut	67.6	0.6	0.004	0.014	0.05	<0.002	<0.02	<0.1
1284	52366	banc lavage	F	Y	11+	1.32669507		Fillet	65.8	<0.4	0.003	0.06	0.04	<0.002	<0.02	<0.1
884	52883		M	Y	1+	1.053166463	immature	Whole	68.4	<0.4	0.003	0.107	0.17	<0.002	<0.02	<0.1
884G	52883		M	Y	1+	1.053166463	immature	Gut	65.5	173	0.296	0.65	4.89	0.007	0.03	0.1
1870	52502		M	Y	1+	0.974074074	immature	Fillet	79.6	<0.4	0.004	0.072	0.14	<0.002	<0.02	<0.1
205	51796		U	Y	1+	1.163092946	immature	Fillet	73.4	<0.4	<0.002	0.07	0.12	<0.002	<0.02	<0.1
841	52875		M	Y	1+	0.91089726		Fillet	77.5	<0.4	<0.002	0.046	0.21	<0.002	<0.02	<0.1
204	51795		M	Y	1+	1.119171532		Whole	67.8	<0.4	0.005	0.094	0.29	<0.002	<0.02	<0.1
204G	51795		M	Y	1+	1.119171532		Gut	64.6	4.2	0.088	0.261	0.34	<0.002	<0.02	<0.1
1864	52501		F	Y	2+	1.039607249	immature	Fillet	75.3	0.5	0.003	0.038	0.22	<0.002	<0.02	<0.2
1862	52500		M	Y	3+	0.954745261		Fillet	69.8	<0.4	0.002	0.027	0.35	<0.002	<0.02	<0.1
1861	52399		M	Y	2+	0.972753692	immature	Whole	71.2	<0.4	0.005	0.057	0.24	<0.002	<0.02	<0.1
1861G	52399		M	Y	2+	0.972753692	immature	Gut	67.1	299	0.403	0.293	6.85	0.012	<0.02	<0.1
1275	52362	lavage/bonk	F	Y	3+	1.004621271	mature	Fillet	71.7	<0.4	<0.002	0.046	0.13	<0.002	<0.02	<0.1
187	51792		F	Y	4+	0.896579059		Whole	64.6	<0.4	0.003	0.118	0.13	<0.002	<0.02	<0.1
187G	51792		F	Y	4+	0.896579059		Gut	25.8	9.1	0.08	0.398	0.33	<0.002	<0.02	<0.1
1368	52372		F	Y	4+	1.046539396	gravid	Whole	68.3	0.8	<0.002	0.086	0.09	<0.002	<0.02	<0.1
1368G	52372		F	Y	4+	1.046539396	gravid	Gut	58.6	22.7	0.024	0.194	0.55	<0.002	<0.02	<0.1
212	51797		F	Y	4+	0.97114753		Fillet	72.9	<0.4	<0.002	0.058	0.26	<0.002	<0.02	<0.1
1265	52361		M	Y	3+	0.927714309		Whole	68.9	<0.4	0.005	0.067	0.6	<0.002	<0.02	<0.1
1265G	52361		M	Y	3+	0.927714309		Gut	71.9	53.9	8	0.787	1.22	0.002	<0.02	<0.1
847	52876		F	Y	3+	1.004505191	gravid	Whole	74.1	<0.4	0.003	0.041	0.06	<0.002	<0.02	<0.1
847G	52876		F	Y	3+	1.004505191	gravid	Gut	67.7	41.9	0.047	0.067	1.23	<0.002	<0.02	<0.1
778	52867		M	Y	4+	1.193322114		Fillet	72.5	<0.4	<0.002	0.041	0.27	<0.002	<0.02	<0.1
1371	52373		F	Y	4+	1.097181092		Whole	58.7	<0.4	<0.002	0.037	0.1	<0.002	<0.02	<0.1
1371G	52373		F	Y	4+	1.097181092		Gut	62.5	49.8	0.059	0.103	1.45	0.003	<0.02	<0.1
1289	52368	banc lavage	F	Y	4+	1.058133315	gravid	Whole	73.1	<0.4	<0.002	0.052	0.16	<0.002	<0.02	<0.1
1289G	52368	banc lavage	F	Y	4+	1.058133315	gravid	Gut	69.7	20.7	0.04	0.057	0.54	<0.002	<0.02	<0.1
791	52869		F	Y	3+	1.1432		Fillet	68.4	1	0.002	0.049	0.17	<0.002	<0.02	<0.2
201	51794		M	Y	4+	0.931709426		Fillet	74.3	<0.4	0.003	0.069	0.35	<0.002	<0.02	<0.1
1286	52367		M	Y	3+	0.740746625		Whole	74.9	<0.4	<0.002	0.085	0.59	<0.002	<0.02	<0.2
1286G	52367		M	Y	3+	0.740746625		Gut	68.6	1.3	<0.002	0.404	0.02	<0.002	<0.02	<0.2
796	52871		M	Y	3+	0.870140444		Fillet	78.1	<0.4	<0.002	0.099	0.64	<0.002	<0.02	<0.1
240	52853		F	Y	3+	0.823322565		Fillet	77.9	<0.4	<0.002	0.058	0.59	<0.002	<0.02	<0.1
241	52854		F	Y	3+	0.84725636	immature	Whole	74.2	<0.4	<0.002	0.092	0.65	<0.002	<0.02	<0.2
241G	52854		F	Y	3+	0.84725636	immature	Gut	71.2	0.8	0.009	0.45	0.02	<0.002	<0.02	<0.2
1855	52398		F	Y	3+	0.790263502	immature	Fillet	76.1	<0.4	<0.002	0.063	0.68	<0.002	<0.02	<0.1
1357	52371		F	Y	3+	0.783513317	immature	Fillet	77.9	<0.4	<0.002	0.045	0.31	<0.002	<0.02	<0.1
1395	52375		U	Y	3+	0.868055556	immature	Whole	73	<0.4	<0.002	0.039	0.09	<0.002	<0.02	<0.2
1395G	52375		U	Y	3+	0.868055556	immature	Gut	68.3	1.5	<0.002	0.244	0.02	<0.002	<0.02	<0.2
883	52899		F	Y	3+	0.866706654		Whole	72.8	0.5	<0.002	0.102	1.32	<0.002	<0.02	<0.2
883G	52899		F	Y	3+	0.866706654		Gut	67.3	3.9	0.007	0.245	0.45	<0.002	<0.02	<0.2
784	52868		M	Y	3+	0.781359986		Fillet	77.8	<0.4	<0.002	0.058	0.55	<0.002	<0.02	<0.1
242	52855		F	Y	3+	0.754109135		Whole	74.8	<0.4	<0.002	0.075	0.51	<0.002	<0.02	<0.1
242G	52855		F	Y	3+	0.754109135		Gut	70	<0.4	0.007	0.211	0.05	<0.002	<0.02	<0.1
1886	52504		M	Y	3+	1.112340421	visceral fat	Whole	74.5	<0.4	<0.002	0.044	0.38	<0.002	<0.02	<0.1
1886G	52504		M	Y	3+	1.112340421	visceral fat	Gut	51	<0.4	0.005	0.089	0.81	<0.002	<0.02	<0.1
850	52878		M	Y	4+	0.939068352	immature	Whole	73.9	<0.4	<0.002	0.031	0.22	<0.002	<0.02	<0.1
850G	52878		M	Y	4+	0.939068352	immature	Gut	57.5	46.2	0.03	0.195	2.87	<0.002	<0.02	<0.1
817	52872		F	Y	4+	0.880326483	immature	Fillet	77.4	<0.4	<0.002	0.052	0.37	<0.002	<0.02	<0.1
1839	52396		F	Y	3+	0.927413797		Fillet	76.7	<0.4	<0.002	0.055	0.59	<0.002	<0.02	<0.1
239	52852		M	Y	4+	0.939014915		Fillet	77.3	<0.4	<0.002	0.052	0.41	<0.002	<0.02	<0.1
1873	52503		F	Y	5+	0.931452445	mature	Whole	73.9	<0.4	<0.002	0.045	0.48	<0.002	<0.02	<0.1
1873G	52503		F	Y	5+	0.931452445	mature	Gut	64.4	0.5	<0.002	0.135	0.08	<0.002	<0.02	<0.1
1279	52365		M	Y	5+	0.878603743		Fillet	75.9	<0.4	<0.002	0.106	0.41	<0.002	<0.02	<0.2
1373	52374		F	Y	5+	0.900960219		Whole	68.9	<0.4	<0.002	0.11	1.53	<0.002	<0.02	<0.1
1373G	52374		F	Y	5+	0.900960219		Gut	72.6	1.7	0.012	0.15	0.33	<0.002	<0.02	<0.1
186	51791		F	Y	6+	0.942968013		Fillet	77.2	<0.4	<0.002	0.027	0.38	<0.002	<0.02	<0.1
1840	52397	fatty	F	Y	8+	1.239176735	weight based on fish weight at capture since gutted fish still exceed digital scale range	Whole	76.4	<0.4	<0.002	0.014	0.28	<0.002	<0.02	<0.1
1840G	52397	fatty	F	Y	8+	1.239176735	weight based on fish weight at capture since gutted fish still exceed digital scale range	Gut	47.1	1	0.006	0.116	0.05	<0.002	<0.02	<0.1
565	52856		F	Y	1+	0.928666267	immature	Whole	74.8	<0.4	<0.002	0.041	0.13	<0.002	<0.02	<0.1
565G	52856		F	Y	1+	0.928666267	immature	Gut	67.6	228	0.01	0.192	1.97	0.01	<0.02	<0.1
955	52889		U	Y	1+	0.944571693	immature	Whole	74.5	<0.4	<0.002	0.019	0.35	<0.002	<0.02	<0.1
955G	52889		U	Y	1+	0.944571693	immature	Gut	80	368	0.008	0.118	5.84	0.016	<0.02	<0.1
1132	52356		M	Y	1+	0.97110866	immature	Whole	70.7	<0.4	<0.002	0.025	0.29	<0.002	<0.02	<0.1
1132G	52356		M	Y	1+	0.97110866	immature	Gut	75.9	596	0.004	0.205	4.74	0.024	<0.02	<0.1

Large Body Fish Data

SampleN	Tag Number	Comments	Sex	otolith Taken	Age (yrs)	Condition (k)	Comments/Internal Parasites/Abnormalities	Tissue Analysed	% Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron
950	52886		M	Y	2+	1.178208184		Fillet	71.9	<0.4	<0.002	0.032	0.22	<0.002	<0.02	<0.1
2136	52519		M	Y	2+	1.10965626		Fillet	72.1	0.6	<0.002	0.05	0.11	<0.002	<0.02	<0.2
1114	52351		M	Y	2+	1.036188272		Whole	68.2	<0.4	<0.002	0.023	0.24	<0.002	<0.02	<0.1
1114G	52351		M	Y	2+	1.036188272		Gut	67.3	7	<0.002	0.018	0.08	<0.002	<0.02	<0.1
1130	52355		M	Y	2+	1.078309746		Whole	68.6	<0.4	<0.002	0.133	0.61	<0.002	<0.02	<0.1
1130G	52355		M	Y	2+	1.078309746		Gut	68.3	<0.4	<0.002	0.057	<0.01	<0.002	<0.02	<0.1
1567	52389	tubes	F	Y	2+	1.237104615		Fillet	70.4	<0.4	<0.002	0.057	0.07	<0.002	<0.02	<0.1
1977	52512		M	Y	2+	1.116239472		Whole	70	<0.4	<0.002	0.146	0.28	<0.002	<0.02	<0.1
1977G	52512		M	Y	2+	1.116239472		Gut	69.5	0.5	<0.002	0.036	0.02	<0.002	<0.02	<0.1
1564	52387		M	Y	2+	1.241622526		Fillet	67.1	<0.4	<0.002	0.042	0.16	<0.002	<0.02	<0.1
2137	52520		F	Y	3+	1.213816558	gravid	Fillet	73.3	0.4	<0.002	0.045	0.19	<0.002	<0.02	<0.2
1129	52354		F	Y	4+	1.274311111	gravid	Fillet	69.5	0.5	<0.002	0.052	0.06	<0.002	<0.02	<0.1
1558	52384		M	Y	5+	1.275155973		Fillet	69.9	<0.4	<0.002	0.067	0.21	<0.002	<0.02	<0.1
1111	52350		M	Y	5+	1.229580783		Whole	63.7	<0.4	0.004	0.146	0.14	<0.002	<0.02	<0.1
1111G	52350		M	Y	5+	1.229580783		Gut	67.4	<0.4	0.004	0.059	<0.01	<0.002	<0.02	<0.1
1953	52505		F	Y	5+	1.0828125	left otolith only - head damaged during capture (perhaps from bonking/euthanizing)	Whole	75.4	<0.4	<0.002	0.119	0.11	<0.002	<0.02	<0.1
1953G	52505		F	Y	5+	1.0828125	left otolith only - head damaged during capture (perhaps from bonking/euthanizing)	Gut	64.4	2.9	<0.002	0.09	0.07	<0.002	<0.02	<0.1
1565	52388	milt	F	Y	5+	1.180453789	0	Whole	68.1	<0.4	<0.002	0.096	0.17	<0.002	<0.02	<0.1
1565G	52388	milt	F	Y	5+	1.180453789	0	Gut	63.1	1.7	<0.002	0.036	0.24	<0.002	<0.02	<0.1
582	52862		F	Y	6+	1.096122749	laceration on right side of body	Fillet	76.4	0.7	<0.002	0.117	0.18	<0.002	<0.02	<0.1
2135	52518		F	Y	7+	1.045404273	gravid	Whole	70.2	<0.4	<0.002	0.139	0.31	<0.002	<0.02	<0.1
2135G	52518		F	Y	7+	1.045404273	gravid	Gut	67.6	0.6	<0.002	0.034	0.06	<0.002	<0.02	<0.1
1560	52385		M	Y	6+	1.105624518		Fillet	66.2	<0.4	0.002	0.099	0.3	<0.002	<0.02	<0.1
2127	52517		F	Y	7+	0.917827448		Fillet	74.7	<0.4	<0.002	0.021	0.04	<0.002	<0.02	<0.2
566	52857		F	Y	2+	0.919930696	immature	Whole	71.6	<0.4	<0.002	0.193	0.23	<0.002	<0.02	<0.1
566G	52857		F	Y	2+	0.919930696	immature	Gut	73.8	1	<0.002	0.253	0.23	<0.002	<0.02	<0.1
1021	52894		M	Y	1+	1.003458886		Whole	73.8	<0.4	<0.002	0.169	0.23	<0.002	<0.02	<0.1
1021G	52894		M	Y	1+	1.003458886		Gut	76.4	24.5	0.015	0.198	0.43	<0.002	<0.02	<0.1
1122	52353		U	Y	1+	1.063441258		Whole	72.1	<0.4	<0.002	0.025	0.53	<0.002	<0.02	<0.1
1122G	52353		U	Y	1+	1.063441258		Gut	69.4	215	0.012	0.16	5.97	0.009	<0.02	<0.1
1502	52382	banc lavage	F	Y	2+	0.875296686		Fillet	75.4	<0.4	<0.002	0.009	0.15	<0.002	<0.02	<0.1
579	52861		U	Y	3+	0.940616945	Immature, sex undetermined	Fillet	77.3	<0.4	<0.002	0.023	0.06	<0.002	<0.02	<0.1
1975	52511		F	Y	3+	0.937541225	Immature	Whole	71.7	<0.4	0.002	0.042	0.4	<0.002	<0.02	<0.1
1975G	52511		F	Y	3+	0.937541225	Immature	Gut	71.3	1.4	<0.002	0.034	0.06	<0.002	<0.02	<0.1
1954	52506		F	Y	3+	0.878741915		Whole	71.2	<0.4	<0.002	0.1	0.26	<0.002	<0.02	<0.1
1954G	52506		F	Y	3+	0.878741915		Gut	74.2	5.2	<0.002	0.358	2.79	<0.002	<0.02	<0.1
1140	52357		M	Y	2+	0.995592592		Whole	69	<0.4	<0.002	0.053	0.43	<0.002	<0.02	<0.1
1140G	52357		M	Y	2+	0.995592592		Gut	76.6	23.1	<0.002	0.037	0.83	<0.002	<0.02	<0.1
588	52863		U	Y	3+	0.974996355	immature	Fillet	74.4	<0.4	<0.002	0.071	0.15	<0.002	<0.02	<0.1
1571	52390		F	Y	3+	0.827039145		Fillet	73.7	<0.4	<0.002	0.034	0.3	<0.002	<0.02	<0.1
954	52888		M	Y	3+	0.883799214		Fillet	73.4	<0.4	<0.002	0.054	0.24	<0.002	<0.02	<0.1
1982	52513		F	Y	2+	0.831155094		Whole	70.2	<0.4	<0.002	0.072	1.51	<0.002	<0.02	<0.1
1982G	52513		F	Y	2+	0.831155094		Gut	69.6	41.5	<0.002	0.136	0.75	<0.002	<0.02	0.1
1563	52386		M	Y	3+	0.880476704		Fillet	77.1	<0.4	<0.002	0.037	0.23	<0.002	<0.02	<0.1
1116	52352		F	Y	3+	0.900842571	immature	Fillet	70.8	0.4	<0.002	0.124	0.15	<0.002	<0.02	<0.2
998	52896		M	Y	4+	4.486925449		Whole	73.2	<0.4	<0.002	0.037	0.23	<0.002	<0.02	<0.1
998G	52896		M	Y	4+	4.486925449		Gut	65.7	1.1	<0.002	0.062	0.12	<0.002	<0.02	<0.1
1573	52391		F	Y	5+	0.871637686		Fillet	76.4	<0.4	<0.002	0.131	0.22	<0.002	<0.02	<0.1
1974	52509		F	Y	5+	0.847061232		Fillet	76.9	<0.4	<0.002	0.138	0.12	<0.002	<0.02	<0.1
935	52884		U	Y	4+	0.900499393		Whole	70.6	<0.4	<0.002	0.13	0.19	<0.002	<0.02	<0.1
935G	52884		U	Y	4+	0.900499393		Gut	69.2	1	0.002	0.41	0.15	<0.002	<0.02	<0.1
1475	52378		F	Y	4+	0.869351262		Whole	75	<0.4	<0.002	0.029	0.47	<0.002	<0.02	<0.1
1475G	52378		F	Y	4+	0.869351262		Gut	71.7	0.7	0.002	0.026	0.26	<0.002	<0.02	<0.1
1988	52514		F	Y	5+	0.872201093		Fillet	75.5	<0.4	<0.002	0.32	0.16	<0.002	<0.02	<0.1
956	52890		M	Y	5+	1.027580578		Fillet	73.5	<0.4	<0.002	0.093	0.3	<0.002	<0.02	<0.2
1955	52507		M	Y	3+	1.049132145	immature	Whole	74.9	<0.4	<0.002	0.065	0.98	<0.002	<0.02	<0.1
1955G	52507		M	Y	3+	1.049132145	immature	Gut	64.2	<0.4	<0.002	0.175	0.08	<0.002	<0.02	<0.1
1465	52377		F	Y	3+	0.841468908		Fillet	78.7	<0.4	<0.002	0.053	0.59	<0.002	<0.02	<0.1
1153	52358		U	Y	3+	0.933182141	gall bladder may have ruptured, yellowish fluid present in abdomen when cut open	Whole	73.5	<0.4	<0.002	0.068	0.51	<0.002	<0.02	<0.1
1153G	52358		U	Y	3+	0.933182141	gall bladder may have ruptured, yellowish fluid present in abdomen when cut open	Gut	51.6	<0.4	<0.002	0.133	0.04	<0.002	<0.02	<0.1
986	52897		M	Y	3+	1.037279653		Whole	74.7	<0.4	<0.002	0.035	0.37	<0.002	<0.02	<0.1
986G	52897		M	Y	3+	1.037279653		Gut	58.3	0.8	<0.002	0.125	0.09	<0.002	<0.02	<0.1
1482	52380		M	Y	3+	0.894795711		Fillet	76.7	<0.4	<0.002	0.051	0.37	<0.002	<0.02	<0.1
953	52887		U	Y	3+	0.737806255		Whole	77.4	0.8	<0.002	0.074	0.46	<0.002	<0.02	<0.1
953G	52887		U	Y	3+	0.737806255		Gut	71.9	0.4	<0.002	0.184	0.05	<0.002	<0.02	<0.1
1956	52508		M	Y	3+	0.762047658		Fillet	78.1	<0.4	<0.002	0.073	0.59	<0.002	<0.02	<0.1
575	52860		M	Y	4+	0.930190459		Fillet	77.5	<0.4	<0.002	0.062	0.43	<0.002	<0.02	<0.1
971	52892		M	Y	3+	0.890259889		Fillet	77	<0.4	<0.002	0.064	0.36	<0.002	<0.02	<0.1
567	52858		M	Y	4+	0.85018918	immature	Whole	71	<0.4	<0.002	0.06	0.5	<0.002	<0.02	<0.1
567G	52858		M	Y	4+	0.85018918	immature	Gut	64.5	0.9	<0.002	0.125	0.19	<0.002	<0.02	<0.1
1154	52359		M	Y	5+	1.034590506		Fillet	77	0.4	<0.002	0.149	0.52	<0.002	<0.02	<0.2
1486	52381		M	Y	4+	0.866066976		Fillet	77.3	<0.4	<0.002	0.05	0.57	<0.002	<0.02	<0.1
1991	52516		M	Y	5+	0.821512521		Fillet	75.9	<0.4	<0.002	0.052	0.31	<0.002	<0.02	<0.1
973	52893		M	Y	4+	0.801749271		Whole	71.2	<0.4	<0.002	0.058	0.62	<0.002	<0.02	<0.1
973G	52893		M	Y	4+	0.801749271		Gut	76.3	<0.4	<0.002	0.151	0.05	<0.002	<0.02	<0.1
1990	52515		M	Y	6+	0.876483597		Whole	71.7	<0.4	<0.002	0.082	0.7	<0.002	<0.02	<0.1
1990G	52515		M	Y	6+	0.876483597		Gut	55.9	0.4	<0.002	0.241	0.06	<0.002	<0.02	<0.1
969	52891		F	Y	6+	0.941353763	mature	Whole	70.9	<0.4	<0.002	0.083	0.02	<0.002	<0.02	<0.1
969G	52891		F	Y	6+	0.941353763	mature	Gut	55.5	<0.4	<0.002	0.404	0.02	<0.002	<0.02	<0.1
1458	52376		F	Y	6+	1.057237387		Fillet	77	<0.4	<0.002	0.081	0.17	<0.002	<0.02	<0.2
976	52894		F	Y	7+	1.002186589	tag had been wrongly recorded (529894)	Whole	74.4	0.5	<0.002	0.115	0.09	<0.002	<0.02	<0.1
976G	52894		F	Y	7+	1.002186589	tag had been wrongly recorded (529894)	Gut	52.3	<0.4	<0.002	0.369	0.02	<0.002	<0.02	<0.1
1478	52379		F	Y	7+	1.068900106		Whole	72.7	<0.4	<0.002	0.057	0.27	<0.002	<0.02	<0.1
1478G	52379		F	Y	7+	1.068900106		Gut	44	0.4	<0.002	0.506	<0.01	<0.002	<0.02	<0.1
1516	52383	PIT#900010000060245	F	Y	9+	1.192437754		Fillet	75.2	0.5	<0.002	0.081	0.53	<0.002	<0.02	<0.1

Large Body Fish Data

SampleN	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Potassium	Rubidium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium
776	0.023	8210	0.02	<0.01	0.026	0.46	8	0.059	422	1.99	0.018	<0.01	0.03	6670	3710	3.11	1.06	<0.002	683	9.38	0.016	<0.02	0.63
776G	4.52	629	0.08	1.1	0.59	13.5	884	12	438	83.5	0.023	0.25	1.49	2100	2750	3.76	2.17	0.062	1040	2.8	0.058	0.7	25.5
1783	0.066	11400	0.06	<0.01	0.031	0.49	7	0.049	515	2.85	0.018	<0.01	0.02	8780	4300	6.02	0.91	<0.002	712	12.2	0.056	<0.02	0.54
1783G	2.32	416	0.12	0.3	0.47	6.95	352	3.08	323	50.5	0.026	0.18	0.68	2290	2760	5.92	2.2	0.09	920	1.6	0.115	0.1	9.22
775	0.008	1520	0.03	<0.01	0.014	0.41	3	0.013	305	0.28	0.026	<0.01	<0.01	3050	3630	3.62	0.66	<0.002	410	1.49	0.012	<0.02	0.25
819	0.005	2010	0.03	<0.01	0.011	0.42	3	0.032	331	0.52	0.022	<0.01	0.01	3490	3550	3.45	0.55	<0.002	362	2.26	0.005	<0.02	0.28
218	0.021	11700	0.04	<0.01	0.022	0.39	7	0.059	457	2.13	0.017	<0.01	0.02	8070	3420	3.97	0.97	<0.002	719	11.4	0.01	<0.02	0.79
218G	1.89	357	0.08	0.8	0.368	9.62	811	6.42	291	39	0.022	0.18	0.92	1930	2470	4.26	3.21	0.033	738	1.78	0.031	0.5	21.4
1277	0.05	3850	0.05	<0.01	0.032	0.43	7	0.055	360	0.72	0.021	<0.01	0.02	4530	3770	5.05	1.21	<0.002	626	3.99	0.018	<0.02	0.44
1277G	0.722	88	0.05	0.02	0.117	1.46	46	0.233	124	5	0.029	0.03	0.08	1610	1980	4.25	3.4	0.004	573	0.13	0.04	<0.02	0.62
832	0.021	11600	0.04	0.01	<0.004	0.29	6	0.037	379	1.33	0.016	<0.01	0.01	7150	3600	3.98	0.5	<0.002	667	10.8	0.008	<0.02	0.76
832G	0.101	74	0.02	<0.01	0.009	0.31	21	0.004	93	0.37	0.017	0.03	<0.01	1610	1650	3.24	2	<0.002	515	0.04	0.015	<0.02	0.2
771	0.053	6420	0.05	<0.01	0.025	0.4	8	0.233	413	1.23	0.052	<0.01	0.01	6130	3940	4.6	0.55	<0.002	606	6.22	0.005	<0.02	0.57
771G	0.15	376	0.03	0.2	0.147	3.45	195	0.451	371	11.5	0.018	0.07	0.14	3990	2320	3.43	4.35	0.007	1030	0.81	0.005	0.1	2.18
1792	0.006	1550	0.05	<0.01	0.023	0.66	7	0.09	298	0.33	0.045	<0.01	0.02	3070	3590	3.29	0.58	<0.002	398	1.33	0.004	<0.02	0.18
793	0.006	576	0.04	<0.01	0.016	0.55	6	0.016	347	0.14	0.04	<0.01	0.02	3290	4310	3.85	0.52	<0.002	404	0.53	0.003	<0.02	0.38
190	0.014	2600	0.04	<0.01	0.019	0.58	11	0.158	269	0.4	0.069	<0.01	0.03	3330	3310	2.51	0.66	<0.002	432	2.66	0.005	<0.02	0.37
1323	0.007	2830	0.04	<0.01	0.013	0.39	7	0.091	324	0.37	0.08	<0.01	0.01	3850	3630	2.9	0.42	<0.002	630	2.77	0.004	<0.02	0.44
221	0.042	4220	0.05	<0.01	0.019	0.5	10	0.164	328	0.92	0.038	<0.01	0.01	4610	3370	3.41	0.87	<0.002	552	4.4	0.003	<0.02	0.3
221G	0.16	114	0.04	0.2	0.162	2.92	312	1.35	211	7.03	0.032	0.06	0.17	8370	3230	4.64	2.24	0.008	1040	0.52	0.009	0.3	5.3
1258	0.011	3900	0.05	<0.01	0.026	0.46	7	0.216	392	0.78	0.072	<0.01	0.03	4940	4010	2.68	0.59	<0.002	585	3.52	0.004	<0.02	0.54
220	0.014	5350	0.06	<0.01	0.019	0.47	8	0.14	376	0.64	0.036	<0.01	0.02	5250	4100	4.07	0.46	<0.002	437	5.72	0.006	<0.02	0.5
223	0.013	20100	0.05	0.01	0.011	0.26	12	0.4	487	2.37	0.134	<0.01	0.02	11600	3400	5.01	0.4	<0.002	1160	15.1	0.008	<0.02	1.04
223G	0.217	235	0.04	0.01	0.043	1.04	127	0.067	255	2.92	0.171	0.03	0.02	2470	2520	4.89	2.6	<0.002	1090	0.12	0.007	<0.02	0.27
1793	0.048	2410	0.1	<0.01	0.017	0.3	12	0.356	284	0.58	0.107	<0.01	0.01	3290	3670	5.73	0.99	<0.002	930	2.5	0.005	<0.02	0.2
1793G	0.207	52	0.09	0.02	0.071	0.69	101	0.133	200	0.99	0.104	0.04	0.03	3320	4010	7.61	2.35	<0.002	1130	0.06	0.034	<0.02	1.04
1791	0.009	1830	0.09	<0.01	0.013	0.45	7	0.082	313	0.3	0.069	<0.01	0.01	3430	4230	4.09	0.45	<0.002	478	1.68	0.003	<0.02	0.21
1320	0.083	1320	0.05	<0.01	0.006	0.23	14	0.059	252	0.24	0.099	<0.01	<0.01	2680	3260	3.09	0.35	<0.002	584	1.16	0.002	<0.02	0.28
1320G	0.163	305	0.02	<0.01	0.021	0.92	52	0.028	307	3.28	0.042	0.02	0.01	2850	1820	1.92	2.81	<0.002	865	0.35	0.003	<0.02	0.26
1284	0.006	729	0.09	<0.01	0.008	0.48	8	0.034	293	0.12	0.105	<0.01	<0.01	3090	3800	5.21	0.5	<0.002	394	0.67	0.007	<0.02	0.37
884	0.008	2740	0.05	<0.01	0.016	0.53	7	0.092	290	0.5	0.024	<0.01	0.01	3610	3730	6.99	0.51	<0.002	692	3.47	0.011	<0.02	0.26
884G	0.438	2400	0.08	0.6	0.206	14.5	464	3	277	15.9	0.019	0.12	0.55	2010	2390	5.73	2.24	0.094	811	4.05	0.034	0.2	21.4
1870	0.002	1200	0.04	<0.01	0.009	0.34	4	0.037	287	0.29	0.028	<0.01	0.03	2790	3610	6.06	0.4	0.002	408	1.56	0.008	<0.02	0.23
205	<0.002	890	0.05	<0.01	0.006	0.3	3	0.031	249	0.19	0.021	<0.01	0.02	2470	3610	8.4	0.38	<0.002	321	1.27	0.014	<0.02	0.27
841	0.003	1040	0.02	<0.01	0.013	0.29	3	0.066	279	0.38	0.022	<0.01	0.03	2690	3950	5	0.46	<0.002	438	1.62	0.008	<0.02	0.26
204	0.004	2570	0.03	<0.01	0.016	0.41	9	0.11	291	0.51	0.019	<0.01	0.01	3680	3430	4.58	0.6	<0.002	613	3.21	0.008	<0.02	0.24
204G	0.053	146	0.02	0.04	0.03	12.2	67	0.654	129	2.28	0.016	0.09	0.04	1800	2130	3.32	2.63	0.058	653	0.3	0.011	0.03	0.42
1864	<0.002	973	0.02	<0.01	0.014	0.38	4	0.033	298	0.24	0.023	<0.01	0.01	2830	4120	4.3	0.43	<0.010	437	1.14	0.003	<0.02	0.37
1862	<0.002	2470	0.03	0.01	0.008	0.49	5	0.081	345	0.72	0.036	<0.01	<0.01	3860	3810	4.36	0.61	<0.002	432	3.98	0.014	<0.02	0.25
1861	0.012	3720	0.04	<0.01	0.023	0.37	9	0.081	316	0.62	0.03	<0.01	0.03	4010	3730	5.58	0.53	<0.002	714	3.62	0.006	<0.02	0.37
1861G	0.514	351	0.09	1	0.471	19.2	1030	2.99	306	24.7	0.018	0.18	1.05	1670	2000	4.53	2.06	0.064	886	1.1	0.025	0.5	33.3
1275	<0.002	752	0.05	<0.01	0.006	0.58	3	0.036	274	0.18	0.041	<0.01	0.01	2520	3710	5.8	0.5	<0.002	345	0.99	0.01	<0.02	0.26
187	0.007	944	0.04	<0.01	0.014	0.3	9	0.109	255	0.18	0.037	<0.01	0.01	2580	3330	6	0.56	<0.002	580	1.2	0.01	<0.02	0.27
187G	0.137	149	0.03	0.04	0.06	7.21	113	1.08	103	1.97	0.039	0.05	0.15	1460	1870	4.53	2.54	0.034	789	0.25	0.013	0.02	1.14
1368	0.005	834	0.05	<0.01	0.014	0.37	6	0.03	264	0.21	0.037	<0.01	0.02	2560	3410	6.28	0.42	<0.002	532	0.84	0.008	<0.02	0.28
1368G	0.096	333	0.03	0.09	0.088	7.32	151	0.357	314	4.53	0.019	0.04	0.15	2480	1920	4.61	3	0.03	731	0.56	0.01	<0.02	2.06
212	<0.002	2130	0.03	<0.01	0.008	0.3	3	0.081	303	0.44	0.032	<0.01	0.02	3310	3730	5.48	0.57	<0.002	395	2.62	0.012	<0.02	0.32
1265	0.008	7850	0.04	<0.01	0.009	0.41	10	0.179	361	0.8	0.032	<0.01	0.03	6330	3680	5.44	0.59	<0.002	728	7.74	0.014	<0.02	0.39
1265G	0.168	128	0.06	0.2	0.102	17.7	170	2.55	192	4.35	0.017	0.05	0.33	4350	3370	6.75	2.43	1.14	902	0.37	0.033	0.6	6.7
847	0.012	322	0.03	<0.01	0.023	0.33	6	0.035	191	0.11	0.039	<0.01	0.02	1850	2630	3.36	0.47	<0.002	586	0.34	0.006	<0.02	0.22
847G	0.184	392	0.03	0.1	0.14	6.53	154	0.612	416	5.49	0.019	0.05	0.26	3080	1990	3.65	2.5	0.026	853	0.98	0.013	<0.02	2.98
778	<0.002	1390	0.04	<0.01	0.012	0.28	4	0.156	284	0.36	0.035	<0.01	0.02	2800	3790	5.72	0.53	<0.002	331	1.71	0.014	<0.02	0.28
1371	0.006	632	0.02	<0.01	0.01	0.38	9	0.022	301	0.15	0.055	<0.01	0.02	2780	3930	2.96	0.52	<0.002	531	0.64	0.011	<0.02	0.29
1371G	0.107	358	0.02	0.2	0.078	10.2	176	1.7	384	7.97	0.015	0.06	0.22	3000	1790	1.99	2.9	0.026	646	0.75	0.013	0.04	3.06
1289	0.005	710	0.06	<0.01	0.009	0.4	10	0.07	239	0.15	0.067	<0.01	<0.01	2390	3300	5.82	0.43	<0.002	648	0.82	0.012	<0.02	0.26
1289G	0.095	289	0.04	0.05	0.06	7.6	123	0.441	339	2.71	0.037	0.05	0.09	2650	2010	5.05	2.89	0.059	800	0.59	0.022	<0.02	1.89
791	<0.002	973	0.04	<0.01	0.005	0.4	4	0.058	310	0.3	0.036	<0.01	<0.01	3040	4150	4.72	0.52	<0.010	378	1.03	0.01	<0.02	0.44
201	<0.002	1610	0.04	<0.01	0.015	0.42	6	0.121	294	0.44	0.044	<0.01	0.02	3020	3680	5.89	0.59	<0.002	428	2.13	0.015	<0.02	0.3
1286	0.007	7860	0.07	<0.01	0.007	0.24	6	0.037	323	0.75	0.143	<0.01	0.01	5680	3600	10.7	0.42	<0.010	849	6.19	0.03	<0.02	0.56
1286G	0.553	145	0.07	<0.01	0.315	6.17	208	0.016	176	1.6	0.063	0.13	0.01	2670	2550	9.43	1.56	<0.010	1060	0.12	0.093	<0.02	0.35
796	<0.002	7990	0.1	<0.01	0.004	0.23	2	0.032	393	0.56	0.145	<0.01	<0.01	6170	3810	11.6	0.46	<0.002	666	7.01	0.038	<0.02	0.37
240	0.002	7310	0.12	<0.01	<0.004	0.24	2	0.016	413	0.91	0.19	<0.01	<0.01	6040	4140	9.12	0.47	<0.002	624	6.29	0.027	<0.02	0.36
241	0.008	7290	0.06	<0.01	0.005	0.26	5	0.013	336	0.81	0.193	<0.01	0.01	5510	3780	10.1	0.39	<0.010	904	6.55	0.037	<0.02	0.57
241G	0.434	82	0.04	<0.01	0.098	2.86	54	0.027	157	1.29	0.044	0.03	0.01	2250	2130	7.09	0.87	<0.010	990	0.06	0.047	<0.02	0.32
1855	0.003	9010	0.07	<0.01	<0.004	0.24	1	0.026	403	0.79	0.253	<0.01	<0.01	6680	4010	8.44	0.35	0.003	677	6.56	0.017	<0.02	0.49
1357	<0.002	4830	0.08	<0.01	<0.004	0.33	2	0.009	358	0.34	0.136	<0.01	0.05	4570	4180	9.78	0.51	<0.002	518	4.5	0.017	<0.02	0.3
1395	0.005	1300	0.07	<0.01	0.006	0.21	4	0.009	232	0.15	0.114	<0.01	0.01	2260	3360	8.65	0.43	<0.010	657	0.98	0.013	<0.02	0.24
1395G	0.837	91	0.03	<0.01	0.034	1.12	22	0.02	55	0.38	0.01	0.02	0.02	732	1030	3.31	0.53	<0.010	501	0.09	0.012	<0.02	0.18
883	0.012	17900	0.08	<0.01	0.007	0.3	9	0.06	462	2.69	0.147	<0.01	0.02	11500	3750	11.6	0.53	<0.010	1120	15.4	0.045	<0.02	1.15
883G	0.298	1650	0.06	0.02	0.107	1.91	109	0.122	189	1.7	0.064	0.11	0.05	2690	1920	7.12	1.27	<0.010	856	3.11	0.045	<0.02	0.63
784	0.002	6500	0.09	<0.01	<0.004	0.25	2	0.017	379	0.59	0.243	<0.01	<0.01	5510	4080	8.58	0.52	<0.002	575	5.9	0.025	<0.02	0.34
242	0.009	7960	0.06	<0.01	0.006	0.27	6	0.015	350	0.78	0.157	<0.01	<0.01	6010	3680	7.94	0.39	<0.002	918	6.28	0.032	<0.02	0.37
242G	0.233	228	0.06	<0.01	0.092	1.28	56	0.02	184	0.77	0.031	0.04	0.03	2080	2880	7.44	0.98	0.006	1360	0.53	0.043	<0.02	0.14
1886	<0.002	5730	0.08	<0.01	<0.004	0.24	2	0.009	365	0.38	0.109	<0.01	<0.01	5110	4180	9.86	0.44	<0.002	530	5.44	0.018	<0.02	0.32
1886G	0.082	3510	0.07	<0.01	0.038	0.6	17	0.221	173	1.62	0.02	0.03	<0.01	3840	2310	5.87	0.74	<0.002	724	7.25	0.026	<0.02	0.23
850	0.007	2590	0.06	<0.01	0.006	0.21	6	0.011	239	0.19	0.134	<0.01	<0.01	2940	3210	5.89	0.45	<0.002	767	1.85	0.007	<0.02	0.28
850G	0.416	8090	0.05	0.1	0.087	1.84	169	0.859	316	4.7	0.029	0.06	0.1	6230	2210	4.31	1.13	0.005	893	19.3	0.02	0.06	5.37
817	<0.002	4620	0.09	<0.01	0.004	0.25	2	0.009	359	0.51	0.157	<0.01	0.01	4530	4350	7.96	0.43	<0.002	529	4.01	0.018	<0.02	0.27
1839	<0.002	8290	0.07	0.01	<0.004	0.25	2	0.013	432	0.54	0.158	<0.01	<0.01	6640	4330	8.95	0.53	0.002	603	7.18	0.016	<0.02	0.4
239	<0.002	4940	0.1	<0.01	<0.004	0.3	2	0.014	338	0.4	0.254	<0.01	<0.01	4600	3930	7.4	0.47	<0.002	575	4.19	0.016	<0.02	0.27
1873	0.009	4030	0.11	<0.01	0.006	0.24	7	0.027	272	0.51	0.259	<0.01	0.01	3760	3200	9.74	0.57	<0.002	965	3.66	0.016	<0.02	0.37
1873G	0.132	279	0.07	<0.01	0.046	0.76	34	0.017	180	2	0.034	0.03	0.02	2010	1830	6.94	1.43	<0.002	678	0.47	0.037	<0.02	0.24
1279	<0.002	6970	0.05	<0.01	<0.004	0.24	2	0.02	383	1.01	0.141	<0.01	<0.01	5550	4190	7.06	0.56	<0.010	534	5.19	0.034	<0.02	0.58
1373	0.022	14900	0.06	<0.01	0.011	0.35	10	0.102	404	1.45	0.139	<0.01	0.02	9170	3340	7.94	0.52	<0.002	1010	12.9	0.028	<0.02	0.89
1373G	0.123	1640	0.03	<0.01	0.071	1.71	33	0.387	228	1.64	0.024	0.03	0.03	2670	2610	5.46	0.82	0.009	870	1.98	0.027	<0.02	0.36
186	<0.002	5160	0.12	<0.01	<0.004	0.2	2	0.01	334	0.5	0.219	<0.01	<0.01	4540	3950	9.2	0.43	<0.002	527	4.49	0.019	<0.02	0.42
1840	0.005	4970	0.05	<0.01	0.004	0.24	7	0.01	237	0.34	0.158	<0.01	0.01	3620	2470	5.49	0.33	<0.002	796	4.08	0.01	<0.02	0.37
1840G	0.07	264	0.03	0.03	0.025	0.7	22	0.019	147	1.21	0.019	0.03	0.04	1710	1550	4.56	1.01	<0.002	646	0.25	0.016	<0.02	0.27
565	0.006	2760	0.02	<0.01	0.014	0.38	6	0.005	312	0.47	0.034	<0.01	0.03	3620	3670	6.75	0.29	<0.002	563	3.25	0.009	<0.02	0.36
565G	0.102	407	0.06	1	0.195	2.67	588	0.288	311	6.45	0.031	0.1	0.68	2180	2430	5.81	0.55	0.005	528	1.41	0.023	0.02	20.2
955	0.008	8510	<0.01	<0.01	0.013	0.43	7	0.005	403	1.68	0.027	<0.01	0.02	6620	3720	5.13	0.54	<0.002	690	9.41	0.013	<0.02	0.66
955G	0.359	7330	0.07	1.5	0.284	2.82	691	0.534	480	21.4	0.031	0.11	1.23	2910	2670	4.97	1.44	0.012	639	11.3	0.026	<0.02	26.3
1132	0.004	4400	0.01	<0.01	0.014	0.5	8	<0.004	326	1.08	0.025	<0.01	0.03	4470	3600	1.9	0.7	<0.002	645	6.4	0.003	<0.02	0.46
1132G	0.063	868	0.07	1.8	0.389	2.33	771	0.523	506	23.3	0.03	0.11	1.49	1950	2180	1.99	1.91	0.007	558	3.01	0.014	<0.02	17.3

Large Body Fish Data

SampleN	Cadmium	Calcium	Cesium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Mercury	Molybdenum	Nickel	Phosphorus	Potassium	Rubidium	Selenium	Silver	Sodium	Strontium	Thallium	Tin	Titanium
950	<0.002	3790	0.01	<0.01	0.006	0.52	5	0.006	378	1.13	0.033	<0.01	<0.01	4420	3810	2.23	0.49	<0.002	511	4.51	0.005	<0.02	0.36
2136	0.002	2300	0.05	<0.01	0.008	0.5	4	0.047	316	0.48	0.033	<0.01	<0.01	3250	3920	3.41	0.57	<0.010	448	1.95	0.019	<0.02	0.4
1114	0.005	3840	0.02	<0.01	0.01	0.38	9	0.007	344	0.82	0.023	<0.01	0.01	4100	3650	2.58	0.87	<0.002	625	3.96	0.004	<0.02	0.41
1114G	0.006	52	0.01	0.02	0.021	0.29	24	0.014	173	0.62	0.009	0.01	0.04	10700	2130	2.25	0.88	<0.002	874	0.07	0.008	<0.02	1.48
1130	0.004	15900	0.04	<0.01	0.013	0.55	9	0.013	539	2.4	0.032	<0.01	0.02	10800	4280	5.17	0.99	<0.002	949	17.1	0.007	<0.02	0.99
1130G	0.006	64	0.02	0.01	0.024	0.33	11	<0.004	231	0.23	0.018	0.01	<0.01	14600	2530	4.92	1.09	<0.002	1020	0.06	0.021	<0.02	1.09
1567	0.004	1550	0.05	<0.01	0.009	0.71	6	0.009	325	0.26	0.023	<0.01	<0.01	3280	3880	3	0.48	<0.002	436	1.7	0.01	<0.02	0.21
1977	0.01	5940	0.03	<0.01	0.011	0.52	6	0.015	348	1.55	0.036	<0.01	0.01	4940	3410	2.65	0.81	<0.002	609	6.41	0.005	<0.02	0.46
1977G	0.013	51	0.02	<0.01	0.018	0.3	7	0.005	180	0.35	0.013	0.01	0.01	11100	2250	2.67	0.83	<0.002	996	0.06	0.012	<0.02	0.89
1564	0.002	2140	0.03	<0.01	0.008	0.8	6	0.044	336	0.68	0.024	<0.01	<0.01	3550	3660	3.11	0.71	<0.002	392	2.5	0.01	<0.02	0.21
2137	0.003	4110	0.05	0.03	0.015	0.49	5	0.011	355	0.96	0.03	<0.01	0.05	4430	3940	6.06	0.42	<0.010	629	4.47	0.005	<0.02	0.46
1129	0.002	1440	0.03	0.07	0.009	0.5	5	0.015	315	0.22	0.028	<0.01	0.01	3020	3550	2.85	0.39	<0.002	457	1.39	0.004	<0.02	0.25
1558	0.002	3860	0.05	<0.01	0.011	0.55	6	0.02	372	0.87	0.055	<0.01	<0.01	4530	3970	4.56	0.65	<0.002	493	4.05	0.007	<0.02	0.27
1111	0.011	2990	0.05	<0.01	0.016	0.57	10	0.119	300	0.54	0.052	<0.01	0.01	3680	3270	3.42	1.13	<0.002	697	2.9	0.007	<0.02	0.39
1111G	0.038	47	0.03	<0.01	0.025	0.33	13	0.04	218	0.2	0.024	0.01	<0.01	13100	2530	4.04	1.07	<0.002	1030	0.05	0.017	<0.02	0.86
1953	0.015	2390	0.13	<0.01	0.021	0.41	7	0.008	267	0.31	0.087	<0.01	0.02	3280	3540	13.1	0.32	<0.002	778	2.99	0.007	<0.02	0.29
1953G	0.019	334	0.05	0.01	0.045	1.07	16	0.006	319	2.92	0.026	0.01	0.02	2950	1910	7.76	1.64	0.003	1030	0.5	0.007	<0.02	0.53
1565	0.017	5130	0.07	<0.01	0.023	0.49	12	0.05	319	0.62	0.032	<0.01	<0.01	4720	3500	4.79	0.57	<0.002	770	5.32	0.007	<0.02	0.3
1565G	0.028	692	0.03	<0.01	0.038	1.21	17	0.015	364	5.28	0.011	0.02	0.01	3810	2210	3.22	3.62	0.005	1070	1.46	0.004	<0.02	0.29
582	0.004	2830	0.05	<0.01	0.01	0.29	6	0.017	275	0.24	0.091	<0.01	0.02	3130	3130	4.7	0.31	<0.002	436	3.9	0.007	<0.02	0.34
2135	0.02	4690	0.04	<0.01	0.026	0.34	13	0.035	303	1.08	0.098	<0.01	0.03	4330	3190	4	0.42	<0.002	1130	4.28	0.003	<0.02	0.41
2135G	0.032	322	0.02	<0.01	0.047	1.01	41	0.015	298	4.18	0.041	0.01	0.03	2780	2030	3.2	1.96	0.004	1080	0.4	0.004	<0.02	0.29
1560	0.005	4410	0.06	<0.01	0.006	0.68	8	0.028	377	0.99	0.048	<0.01	<0.01	4830	3670	4.08	0.67	<0.002	527	5.18	0.006	<0.02	0.3
2127	0.003	911	0.03	<0.01	0.016	0.36	6	0.007	250	0.25	0.083	<0.01	0.03	2540	3540	2.36	0.43	<0.010	747	0.91	0.002	<0.02	0.47
566	0.007	1980	0.06	<0.01	0.009	0.74	11	<0.004	263	0.57	0.035	<0.01	0.01	3120	3390	10.5	0.34	<0.002	548	2.46	0.016	<0.02	0.36
566G	0.327	389	0.06	0.01	0.044	208	329	0.014	229	2.97	0.065	0.19	0.04	3000	2860	10.2	18.5	1.16	869	1.04	0.149	<0.02	0.29
1021	0.013	2720	0.04	0.01	0.016	0.61	8	0.021	315	0.46	0.042	<0.01	0.02	3830	3920	9.27	0.38	<0.002	776	3.69	0.014	<0.02	0.36
1021G	0.266	203	0.04	0.09	0.05	47.5	114	0.38	234	2.12	0.051	0.2	0.09	3170	3310	8.65	6.92	0.921	855	0.46	0.057	<0.02	2.19
1122	0.004	4070	0.01	<0.01	0.011	0.57	9	0.035	321	0.81	0.031	<0.01	0.02	4310	3480	3.02	0.44	<0.002	738	7.25	0.006	<0.02	0.46
1122G	0.123	10700	0.05	0.6	0.187	10.2	437	1.72	343	16.8	0.023	0.13	0.76	2260	3230	3.71	1.09	0.076	921	15.4	0.022	<0.02	14.5
1502	<0.002	1150	0.02	<0.01	<0.004	0.35	3	<0.004	332	0.3	0.049	<0.01	0.01	3160	4170	2.83	0.45	<0.002	389	1.61	0.004	<0.02	0.2
579	0.002	594	0.03	<0.01	0.005	0.3	3	0.004	268	0.12	0.02	<0.01	<0.01	2550	3920	3.18	0.73	<0.002	419	1	0.004	<0.02	0.15
1975	0.004	3650	0.03	<0.01	0.01	0.35	9	0.007	310	0.55	0.038	<0.01	0.01	4110	3770	4.72	0.39	<0.002	842	5.35	0.006	<0.02	0.26
1975G	0.036	132	0.03	<0.01	0.021	4.46	54	0.022	163	1.15	0.034	0.05	0.02	2240	3180	4.78	1.26	0.046	952	0.21	0.015	<0.02	0.25
1954	0.003	1840	0.07	<0.01	0.01	0.42	9	0.005	272	0.31	0.051	<0.01	<0.01	3050	3710	9.01	0.37	<0.002	769	3.06	0.015	<0.02	0.19
1954G	0.046	1350	0.06	0.05	0.029	7.55	60	0.03	217	1.99	0.032	0.08	0.06	2450	2930	8.26	1.79	0.048	1040	6.23	0.036	<0.02	0.43
1140	0.012	2790	0.02	<0.01	0.01	0.45	11	0.006	272	0.32	0.047	<0.01	0.02	3340	3180	4.57	0.42	<0.002	687	3.53	0.006	<0.02	0.33
1140G	0.112	2610	0.02	0.08	0.041	4.64	71	0.032	217	2.82	0.025	0.05	0.15	6770	2950	5.04	1.12	0.086	941	3.2	0.017	<0.02	3.01
588	0.01	1140	0.02	<0.01	0.009	0.39	4	0.025	294	0.24	0.041	<0.01	0.01	2880	4090	5.99	0.42	<0.002	402	1.53	0.012	<0.02	0.3
1571	<0.002	1230	0.03	<0.01	0.006	0.33	4	0.006	302	0.34	0.048	<0.01	<0.01	3030	3900	4.54	0.49	<0.002	438	2.11	0.009	<0.02	0.19
954	0.003	842	0.04	<0.01	0.005	0.37	13	0.011	293	0.23	0.06	<0.01	<0.01	2950	4020	7.78	0.43	<0.002	542	1.37	0.015	<0.02	0.45
1982	0.004	10300	0.03	0.04	0.011	0.38	9	0.016	429	2	0.08	<0.01	0.04	7540	3650	6.06	0.36	<0.002	793	16	0.011	<0.02	0.67
1982G	0.078	526	0.04	0.1	0.069	10.7	280	0.065	310	6.53	0.074	0.14	0.2	3360	2280	4.99	2.11	0.275	825	1.82	0.039	<0.02	1.95
1563	<0.002	1140	0.07	<0.01	0.007	0.44	5	0.011	310	0.3	0.072	<0.01	<0.01	2970	3940	8.83	0.36	<0.002	480	1.85	0.016	<0.02	0.2
1116	<0.002	1380	0.07	<0.01	0.006	0.38	3	0.004	293	0.28	0.068	<0.01	0.01	2950	3810	11.1	0.47	<0.010	477	1.8	0.017	<0.02	0.34
998	0.003	1200	0.04	<0.01	0.006	0.36	7	0.004	301	0.29	0.097	<0.01	0.01	2970	3880	5.76	0.43	<0.002	623	1.46	0.006	<0.02	0.3
998G	0.035	79	0.03	0.02	0.036	3.43	120	0.019	177	1.9	0.074	0.02	0.07	3140	3350	5.4	0.78	0.008	971	0.18	0.012	<0.02	0.36
1573	0.003	670	0.07	<0.01	0.006	0.33	4	0.007	320	0.15	0.164	<0.01	<0.01	2880	4370	7.48	0.41	<0.002	487	1.18	0.013	<0.02	0.19
1974	0.003	579	0.15	<0.01	0.006	0.41	10	0.008	282	0.1	0.277	<0.01	<0.01	2620	4210	11.4	0.36	<0.002	578	0.88	0.023	<0.02	0.17
935	0.016	1210	0.04	<0.01	0.033	0.32	8	0.012	279	0.25	0.073	<0.01	0.01	2840	3360	7.21	0.43	<0.002	657	1.85	0.009	<0.02	0.31
935G	0.271	153	0.03	<0.01	0.079	26.7	149	0.039	130	0.8	0.064	0.1	0.02	1890	2130	5.29	6.47	0.518	955	0.41	0.02	<0.02	0.22
1475	0.005	2070	0.08	0.02	0.005	0.32	11	0.018	268	0.2	0.193	<0.01	0.01	2910	3620	7.53	0.43	<0.002	794	2.81	0.009	<0.02	0.29
1475G	0.027	321	0.05	0.03	0.023	4.32	92	0.018	399	1.27	0.108	0.05	0.01	3210	2380	6.21	1.92	0.036	950	0.57	0.014	<0.02	0.27
1988	0.007	980	0.12	<0.01	0.009	0.4	7	0.017	280	0.14	0.26	<0.01	<0.01	2750	4190	10.4	0.42	<0.002	489	1.37	0.023	<0.02	0.18
956	<0.002	1240	0.07	<0.01	0.007	0.52	5	0.006	289	0.29	0.075	<0.01	0.01	2810	3770	10.1	0.45	<0.010	496	1.76	0.015	<0.02	0.33
1955	0.008	12000	0.06	<0.01	0.008	0.3	5	0.023	395	0.74	0.146	<0.01	0.01	7920	3560	8.57	0.49	<0.002	939	11	0.016	<0.02	0.71
1955G	0.11	531	0.04	<0.01	0.039	0.72	25	0.004	155	0.52	0.029	0.03	0.02	2270	2290	6.96	0.73	<0.002	732	0.98	0.024	<0.02	0.23
1465	0.002	7950	0.08	<0.01	<0.004	0.29	2	0.015	438	0.78	0.151	<0.01	<0.01	6460	4140	8.64	0.46	<0.002	627	7.16	0.018	<0.02	0.39
1153	0.008	6710	0.08	<0.01	0.005	0.26	4	0.02	361	0.71	0.149	<0.01	<0.01	5410	3910	10.4	0.4	<0.002	822	6.27	0.016	<0.02	0.33
1153G	0.144	191	0.05	<0.01	0.045	0.98	40	0.009	131	0.52	0.034	0.04	0.01	1660	2170	6.82	0.78	0.003	872	0.44	0.018	<0.02	0.13
986	0.005	4380	0.07	<0.01	0.006	0.26	7	0.014	272	0.62	0.124	<0.01	0.01	3960	3550	10.5	0.37	0.003	829	4.37	0.01	<0.02	0.37
986G	0.102	557	0.05	<0.01	0.042	1.45	58	0.006	123	0.54	0.056	0.03	0.02	1690	1910	6.97	0.71	<0.002	832	0.78	0.016	<0.02	0.2
1482	<0.002	5490	0.11	<0.01	<0.004	0.23	2	0.005	389	0.47	0.191	<0.01	<0.01	4940	4290	13.5	0.39	<0.002	596	5.42	0.013	<0.02	0.31
953	0.015	5130	0.05	<0.01	0.005	0.23	6	0.015	289	0.56	0.139	<0.01	0.01	4240	3300	8.49	0.39	<0.002	836	4.18	0.027	<0.02	0.41
953G	0.508	164	0.04	<0.01	0.154	1.21	87	0.011	152	1.03	0.059	0.08	<0.01	2040	2130	6.02	0.93	0.002	907	0.25	0.049	<0.02	0.21
1956	<0.002	6890	0.07	<0.01	0.004	0.32	2	0.01	376	0.43	0.127	<0.01	<0.01	5690	4310	9.83	0.41	<0.002	605	6.22	0.031	<0.02	0.36
575	<0.002	6380	0.12	<0.01	<0.004	0.24	2	0.009	388	0.47	0.178	<0.01	<0.01	5360	4110	13.8	0.39	<0.002	559	5.98	0.017	<0.02	0.33
971	<0.002	4050	0.06	<0.01	<0.004	0.25	2	0.009	325	0.38	0.124	<0.01	<0.01	4050	3950	8.34	0.39	<0.002	614	3.68	0.012	<0.02	0.26
567	0.006	6090	0.07	<0.01	0.006	0.27	4	0.011	325	0.46	0.117	<0.01	0.01	4960	3740	8.7	0.52	<0.002	994	5.44	0.015	<0.02	0.46
567G	0.219	946	0.04	<0.01	0.046	0.97	37	0.008	168	1.09	0.026	0.04	0.01	1970	1980	5.76	0.97	<0.002	920	2.27	0.025	<0.02	0.21
1154	<0.002	7430	0.1	<0.01	<0.004	0.21	1	0.014	381	0.51	0.199	<0.01	0.02	5770	3930	11.5	0.41	0.017	562	6.91	0.016	<0.02	0.6
1486	0.002	9200	0.12	<0.01	<0.004	0.24	2	0.011	434	0.66	0.279	<0.01	<0.01	6760	4270	13.9	0.38	<0.002	632	7.87	0.012	<0.02	0.42
1991	<0.002	4610	0.1	<0.01	<0.004	0.27	2	0.012	347	0.36	0.169	<0.01	<0.01	4750	4330	10.3	0.52	<0.002	605	4.86	0.008	<0.02	0.29
973	0.011	8300	0.09	<0.01	0.006	0.21	6	0.04	362	1.07	0.213	<0.01	0.01	6250	3730	10.9	0.45	<0.002	1060	7.06	0.01	<0.02	0.57
973G	0.235	403	0.07	<0.01	0.09	1.03	79	0.005	163	0.62	0.051	0.04	<0.01	2620	2830	9.76	0.73	<0.002	899	0.77	0.017	<0.02	0.23
1990	0.008	9750	0.1	<0.01	0.005	0.27	13	0.046	346	1.01	0.147	<0.01	0.02	6850	3410	13.7	0.48	<0.002	1020	8.92	0.01	<0.02	0.63
1990G	0.052	642	0.07	<0.01	0.041	0.75	88	0.006	207	0.96	0.033	0.02	<0.01	2550	2340	11.4	1.1	<0.002	829	1.04	0.018	<0.02	0.27
969	0.003	549	0.09	<0.01	<0.004	0.26	8	<0.004	202	0.06	0.174	<0.01	<0.01	1870	2980	12.7	0.37	<0.002	923	0.39	0.005	<0.02	0.2
969G	0.084	133	0.06	<0.01	0.035	1.25	27	<0.004	123	0.69	0.022	0.03	<0.01	1530	1700	8.66	0.67	<0.002	706	0.15	0.015	<0.02	0.19
1458	<0.002	2500	0.11	<0.01	<0.004	0.24	2	<0.004	319	0.2	0.338	<0.01	<0.01	3510	4380	14.9	0.32	<0.010	473	2.44	0.007	<0.02	0.37
976	0.012	1710	0.09	<0.01	<0.004	0.44	19	<0.004	226	0.12	0.214	<0.01	<0.01	2530	3190	12	0.44	<0.002	901	1.43	0.006	<0.02	0.3
976G	0.07	120	0.06	<0.01	0.025	0.91	22	<0.004	153	0.57	0.035	0.02	<0.01	1840	1860	8.33	0.78	0.002	670	0.09	0.012	<0.02	0.16
1478	0.003	4080	0.11	<0.01	<0.004	0.16	3	0.006	313	0.2	0.248	<0.01	<0.01	3910	3460	14.4	0.33	<0.002	661	3.36	0.01	<0.02	0.36
1478G	0.037	92	0.04	<0.01	0.021	0.38	19	<0.004	85	0.36	0.019	0.01	<0.01	1030	1020	5.28	0.44	<0.002	436	0.07	0.009	<0.02	0.14
1516	<0.002	9710	0.12	0.01	<0.004	0.39	3	0.014	432	0.44	0.293	<0.01	<0.01	7240	4080	11.9	0.44	0.005	594	7.8	0.023	<0.02	0.45

Large Body Fish Data

SampleN	Uranium	Vanadium	Zinc	Total Lipids
776	0.001	<0.02	17.9	5.9
776G	0.182	0.96	163	20
1783	0.003	<0.02	18.6	6.2
1783G	0.15	0.49	104	7
775	<0.001	<0.02	7.3	4.9
819	0.002	<0.02	10.9	7.7
218	0.004	<0.02	18.8	8.2
218G	0.167	0.8	270	14
1277	0.002	<0.02	14.9	7.4
1277G	0.007	<0.02	58.9	33
832	0.002	<0.02	12.3	8.3
832G	<0.001	<0.02	31.4	29
771	0.01	<0.02	13.5	11
771G	0.017	0.1	66.3	11
1792	0.002	<0.02	9.7	5.9
793	<0.001	<0.02	5.8	9.3
190	0.005	<0.02	14.2	6.6
1323	0.002	<0.02	11.4	8
221	0.004	<0.02	14.8	14
221G	0.032	0.19	114	5.1
1258	0.012	<0.02	12.6	5.3
220	0.003	<0.02	10.7	9.1
223	0.015	0.05	19.3	5.2
223G	0.007	0.03	48.9	7.3
1793	0.006	<0.02	7.6	5.2
1793G	0.01	0.05	37.5	2.8
1791	0.004	<0.02	7.7	7.5
1320	0.002	<0.02	7.3	11
1320G	0.005	<0.02	43.2	2.6
1284	0.002	<0.02	5.5	12
884	<0.001	<0.02	11.4	8.1
884G	0.127	0.6	111	15
1870	0.002	<0.02	9.3	2.9
205	<0.001	<0.02	6.2	7.1
841	<0.001	<0.02	9.1	2.5
204	0.001	<0.02	13.8	11
204G	0.003	<0.02	93.8	22
1864	<0.001	<0.02	8.7	3.8
1862	0.001	<0.02	14.8	5.2
1861	0.003	<0.02	12.9	5.2
1861G	0.234	0.89	147	9.9
1275	<0.001	<0.02	5.3	5.5
187	<0.001	<0.02	9.5	11
187G	0.012	0.04	267	22
1368	<0.001	<0.02	7.7	7.9
1368G	0.025	0.09	86.7	19
212	0.001	<0.02	10.3	6.5
1265	0.007	<0.02	13.1	9.8
1265G	0.07	0.17	84.5	9.2
847	<0.001	<0.02	6.5	4.3
847G	0.036	0.16	71.9	7.1
778	<0.001	<0.02	8.4	4.4
1371	<0.001	<0.02	6.2	5.1
1371G	0.072	0.14	65	17
1289	<0.001	<0.02	9.4	5.8
1289G	0.021	0.08	78.1	7.8
791	<0.001	<0.02	6.9	6.6
201	0.002	<0.02	11.3	3.7
1286	<0.001	<0.02	10.2	1.8
1286G	<0.001	<0.02	28.6	7.9
796	<0.001	<0.02	10	0.9
240	<0.001	<0.02	10.5	0.8
241	<0.001	<0.02	10.2	2
241G	<0.001	<0.02	54.4	12
1855	<0.001	<0.02	10.7	0.7
1357	<0.001	<0.02	8.4	0.9
1395	<0.001	<0.02	7.4	2
1395G	<0.001	<0.02	7.8	15
883	0.001	<0.02	15.1	2.5
883G	0.004	0.03	23.6	17
784	<0.001	<0.02	9.2	0.6
242	<0.001	<0.02	10.7	2
242G	<0.001	<0.02	29.4	6
1886	<0.001	<0.02	8.3	1.7
1886G	0.002	0.02	18.3	20
850	<0.001	<0.02	7.4	2
850G	0.008	0.29	43	8.9
817	<0.001	<0.02	7.6	1.1
1839	<0.001	<0.02	11.5	0.8
239	<0.001	<0.02	9.3	1
1873	<0.001	<0.02	9.5	2.6
1873G	<0.001	<0.02	22	23
1279	<0.001	<0.02	11.5	0.8
1373	<0.001	<0.02	16.2	1.8
1373G	<0.001	<0.02	23.7	9.6
186	<0.001	<0.02	10	1
1840	<0.001	<0.02	9.7	1.3
1840G	<0.001	<0.02	15	42
565	0.001	<0.02	11.2	3.6
565G	0.158	1.17	63	13
955	0.001	<0.02	15.8	2.9
955G	0.158	1.08	75.5	5.2
1132	0.002	<0.02	14.5	4.5
1132G	0.288	2.41	83.5	5.2

Large Body Fish Data

SampleN	Uranium	Vanadium	Zinc	Total Lipids
950	0.001	<0.02	10	6.7
2136	0.001	<0.02	7.3	4.8
1114	0.001	<0.02	10.4	4.9
1114G	0.004	0.03	18.5	5.2
1130	0.003	<0.02	19.9	7.4
1130G	<0.001	<0.02	27.5	6.2
1567	<0.001	<0.02	8.6	5.6
1977	0.003	<0.02	14	6.3
1977G	<0.001	<0.02	25.5	3.9
1564	0.001	<0.02	10.5	9.2
2137	0.002	<0.02	11.1	4.2
1129	<0.001	<0.02	7.8	8.9
1558	0.005	<0.02	10	7.9
1111	0.004	<0.02	13.9	13
1111G	0.001	<0.02	18.4	5.7
1953	0.005	<0.02	9.3	1.6
1953G	0.004	<0.02	42.1	1.9
1565	0.002	<0.02	11.2	9.3
1565G	0.002	<0.02	65.1	3.1
582	0.002	<0.02	11.9	4
2135	0.009	<0.02	13.5	8
2135G	0.009	<0.02	41	2.3
1560	0.004	<0.02	16.7	7.7
2127	0.001	<0.02	7.5	2.4
566	<0.001	<0.02	24.2	6.7
566G	0.002	<0.02	225	6.9
1021	<0.001	<0.02	15.1	4.1
1021G	0.012	0.08	94	6.6
1122	<0.001	<0.02	16.7	5.8
1122G	0.101	0.61	119	7.6
1502	<0.001	<0.02	12.6	2.6
579	<0.001	<0.02	9.7	1.7
1975	0.001	<0.02	20	5.4
1975G	0.003	<0.02	124	8.1
1954	<0.001	<0.02	11.4	6.5
1954G	0.005	0.02	118	4.7
1140	0.001	<0.02	11.6	7.5
1140G	0.012	0.08	41.7	5.5
588	<0.001	<0.02	13.2	2.4
1571	<0.001	<0.02	11.2	1.4
954	<0.001	<0.02	12.6	2.9
1982	0.002	<0.02	24.1	5.1
1982G	0.011	0.11	75.1	5.9
1563	<0.001	<0.02	10.7	1.8
1116	<0.001	<0.02	12.2	5.8
998	<0.001	<0.02	12.1	6.1
998G	0.003	<0.02	111	6.8
1573	<0.001	<0.02	6.9	1.1
1974	<0.001	<0.02	9.5	1.3
935	<0.001	<0.02	11.4	7
935G	0.002	<0.02	125	8
1475	<0.001	<0.02	11.9	3.1
1475G	0.002	<0.02	67.6	5.2
1988	<0.001	<0.02	8	2.6
956	<0.001	<0.02	7	1.2
1955	<0.001	<0.02	13.1	2
1955G	<0.001	<0.02	16.2	14
1465	<0.001	<0.02	10.4	0.7
1153	<0.001	<0.02	12.2	2.4
1153G	<0.001	<0.02	18.8	27
986	<0.001	<0.02	11.2	1.9
986G	<0.001	<0.02	16.4	12
1482	<0.001	<0.02	7.9	0.9
953	<0.001	<0.02	11.1	2
953G	<0.001	<0.02	21	9
1956	<0.001	<0.02	8.4	0.9
575	<0.001	<0.02	8	0.7
971	<0.001	<0.02	8.3	0.7
567	<0.001	<0.02	11.4	2
567G	<0.001	<0.02	22.4	12
1154	<0.001	<0.02	7.9	1.2
1486	<0.001	<0.02	10.1	0.9
1991	<0.001	<0.02	8.1	1.4
973	<0.001	<0.02	15.7	2.1
973G	<0.001	<0.02	17	8.2
1990	<0.001	<0.02	15.4	2
1990G	<0.001	<0.02	24.5	15
969	<0.001	<0.02	10.4	1.7
969G	<0.001	<0.02	18.9	34
1458	<0.001	<0.02	7.6	1.1
976	<0.001	<0.02	12.5	1.8
976G	<0.001	<0.02	20.6	38
1478	<0.001	<0.02	6.9	1.9
1478G	<0.001	<0.02	11.6	42
1516	<0.001	<0.02	10.7	0.8

APPENDIX H

LARGE BODIED FISH ANCOVA RESULTS

LARGE BODY FISH CONDITION ANCOVA RESULTS:

RAINBOW TROUT:

- No significant effect of fork length, treatment, sex, or sex*treatment interaction

```
Residuals:
     Min       1Q   Median       3Q      Max 
-0.66583 -0.06519 -0.02444  0.02720  2.94062 

Coefficients:
                                Estimate Std. Error t value Pr(>|t|)
(Intercept)                      1.02906    0.19422   5.298 9.13e-06
***
treatment[T.Reference]          -0.15353    0.26189  -0.586   0.5620
Sex[T.M]                        -0.02488    0.27467  -0.091   0.9284
treatment[T.Reference]:Sex[T.M]  0.69566    0.40360   1.724   0.0947 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5827 on 31 degrees of freedom
Multiple R-squared:  0.1481,	Adjusted R-squared:  0.06565 
F-statistic: 1.796 on 3 and 31 DF,  p-value: 0.1684
```

MOUNTAIN WHITE FISH:

- No effect of fork length, treatment or sex, or sex*treatment interaction

```
Residuals:
     Min       1Q   Median       3Q      Max 
-0.45879 -0.07118 -0.01515  0.10370  0.26769 

Coefficients:
                                Estimate Std. Error t value Pr(>|t|)
(Intercept)                      1.17212    0.04563  25.686   <2e-16
***
treatment[T.Reference]          -0.06362    0.06630  -0.960    0.344
Sex[T.M]                        -0.10064    0.06630  -1.518    0.138
treatment[T.Reference]:Sex[T.M]  0.12630    0.09377   1.347    0.187
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1443 on 34 degrees of freedom
Multiple R-squared:  0.06738,	Adjusted R-squared:  -0.01491 
F-statistic: 0.8188 on 3 and 34 DF,  p-value: 0.4925
```

WALLEYE:

- Overall model not significant, but some evidence that condition is slightly higher in reference sites based on individual explanatory variable p-values. However, this may be associated with differences in fork length among individuals sampled in reference and exposure sites, as when you add fork length in to model, it has a significant (but very small effect), and treatment becomes no longer significant.

```
Residuals:
     Min       1Q   Median       3Q      Max 
-0.17881 -0.07911 -0.01340  0.04456  0.34855 

Coefficients:
                                 Estimate Std. Error t value Pr(>|t|)
(Intercept)                      0.890622   0.033624  26.487   <2e-16
***
```

```
treatment[T.Reference]           0.129657   0.062000   2.091   0.0445 *
Sex[T.M]                         0.003845   0.055397   0.069   0.9451
treatment[T.Reference]:Sex[T.M] -0.122933   0.083144  -1.479   0.1490
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1165 on 32 degrees of freedom
Multiple R-squared:  0.1348,	Adjusted R-squared:  0.05367 
F-statistic: 1.662 on 3 and 32 DF,  p-value: 0.1949
```

Output from model including forklength:

```
lm(formula = Condition..k. ~ Fork.Length + treatment * Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.130603 -0.061159  0.004242  0.032654  0.207690 

Coefficients:
                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                      0.4362649  0.1012024   4.311 0.000153
***
Fork.Length                      0.0011685  0.0002514   4.648 5.87e-05
***
treatment[T.Reference]           0.0044313  0.0553535   0.080 0.936708
Sex[T.M]                         0.0360351  0.0437566   0.824 0.416494
treatment[T.Reference]:Sex[T.M] -0.0036058  0.0697420  -0.052 0.959097
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.09084 on 31 degrees of freedom
Multiple R-squared:  0.4902,	Adjusted R-squared:  0.4244 
F-statistic: 7.451 on 4 and 31 DF,  p-value: 0.000251
```

LARGE BODY FISH TISSUE ANCOVA RESULTS:

LARGE BODY FISH FILLET ANCOVA RESULTS:

ARSENIC

```
lm(formula = log(Arsenic) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.49352 -0.20330 -0.02524  0.20755  0.94319 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)            -3.9805011  0.3873327 -10.277 5.04e-14 ***
treatment[T.Reference]  0.0736256  0.1215502   0.606   0.5474    
Species[T.RB]          -0.1168211  0.1545637  -0.756   0.4532    
Species[T.WP]           0.0908739  0.1462195   0.621   0.5370    
Fork.Length             0.0025528  0.0009588   2.663   0.0103 *  
Sex[T.M]                0.1779705  0.1269116   1.402   0.1669    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.4565 on 51 degrees of freedom
Multiple R-squared:  0.1622,	Adjusted R-squared:  0.08006 
F-statistic: 1.975 on 5 and 51 DF,  p-value: 0.09825
```

CADMIUM

```
lm(formula = Cadmium ~ treatment + Species + Fork.Length + Sex)

Residuals:
       Min         1Q     Median         3Q        Max 
-0.0038991 -0.0015918 -0.0005399  0.0008863  0.0073630 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)            3.792e-03  2.016e-03   1.881  0.06563 .  
treatment[T.Reference] -1.791e-03  6.404e-04  -2.796  0.00723 ** 
Species[T.RB]          -4.754e-03  8.156e-04  -5.829 3.58e-07 ***
Species[T.WP]          -5.137e-03  7.771e-04  -6.610 2.07e-08 ***
Fork.Length             7.845e-06  4.982e-06   1.575  0.12140    
Sex[T.M]               -2.689e-04  6.732e-04  -0.399  0.69122    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.002426 on 52 degrees of freedom
Multiple R-squared:  0.5421,	Adjusted R-squared:  0.4981 
F-statistic: 12.31 on 5 and 52 DF,  p-value: 6.758e-08
```

CHROMIUM

```
lm(formula = log(Chromium) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
       Min         1Q     Median         3Q        Max 
-1.155e-14 -1.340e-16  7.330e-17  6.928e-16  1.363e-15 

Coefficients:
                         Estimate Std. Error    t value Pr(>|t|)    
(Intercept)            -9.210e+00  1.705e-15 -5.403e+15   <2e-16 ***
```

```
treatment[T.Reference]  5.221e-16  4.959e-16  1.053e+00    0.298
Species[T.RB]           7.499e-16  6.280e-16  1.194e+00    0.238
Species[T.WP]           7.678e-16  5.975e-16  1.285e+00    0.205
Fork.Length            -3.247e-18  4.212e-18 -7.710e-01    0.445
Sex[T.M]               -6.807e-16  5.204e-16 -1.308e+00    0.197
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.783e-15 on 47 degrees of freedom
Multiple R-squared:  0.5328,   Adjusted R-squared:  0.4831
F-statistic: 10.72 on 5 and 47 DF,  p-value: 6.492e-07
```

COPPER

```
lm(formula = log(Copper) ~ treatment + Species + Fork.Length +
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max
-0.54242 -0.10717 -0.01292  0.09940  0.47979

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)            -0.9996945  0.1662621  -6.013 1.84e-07 ***
treatment[T.Reference]  0.0440292  0.0528121   0.834    0.408
Species[T.RB]          -0.2958749  0.0672634  -4.399 5.42e-05 ***
Species[T.WP]          -0.6829154  0.0640873 -10.656 1.11e-14 ***
Fork.Length             0.0006776  0.0004108   1.649    0.105
Sex[T.M]                0.0770403  0.0555170   1.388    0.171
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2001 on 52 degrees of freedom
Multiple R-squared:  0.6903,   Adjusted R-squared:  0.6605
F-statistic: 23.18 on 5 and 52 DF,  p-value: 3.65e-12
```

IRON

```
lm(formula = Iron ~ treatment + Species + Fork.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max
-2.30044 -0.51645 -0.01515  0.58566  1.69520

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)             2.138094   0.742479   2.880  0.00589 **
treatment[T.Reference] -0.105308   0.241883  -0.435  0.66521
Species[T.RB]          -2.204814   0.312548  -7.054 5.47e-09 ***
Species[T.WP]          -4.215920   0.289800 -14.548  < 2e-16 ***
Fork.Length             0.010371   0.001847   5.615 9.12e-07 ***
Sex[T.M]                0.175570   0.253941   0.691  0.49259
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8881 on 49 degrees of freedom
Multiple R-squared:  0.8251,   Adjusted R-squared:  0.8073
F-statistic: 46.24 on 5 and 49 DF,  p-value: < 2.2e-16
```

LEAD

```
lm(formula = log(Lead) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-3.7368 -0.3311  0.2137  0.5161  1.9432 

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)    
(Intercept)              -4.637341   0.834773  -5.555 9.61e-07 ***
treatment[T.Reference] -1.636141   0.265160  -6.170 1.04e-07 ***
Species[T.RB]            -0.744926   0.337718  -2.206 0.031844 *  
Species[T.WP]            -1.304383   0.321771  -4.054 0.000169 ***
Fork.Length               0.004375   0.002063   2.121 0.038718 *  
Sex[T.M]                  0.866098   0.278741   3.107 0.003058 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.005 on 52 degrees of freedom
Multiple R-squared:  0.5298,	Adjusted R-squared:  0.4846 
F-statistic: 11.72 on 5 and 52 DF,  p-value: 1.307e-07
```

MERCURY

```
lm(formula = Mercury ~ treatment + Species + Fork.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.071679 -0.031957 -0.005142  0.016043  0.151035 

Coefficients:
                           Estimate Std. Error t value Pr(>|t|)    
(Intercept)              -1.077e-01  3.917e-02  -2.749   0.0082 ** 
treatment[T.Reference]  2.653e-02  1.244e-02   2.133   0.0377 *  
Species[T.RB]             7.848e-03  1.585e-02   0.495   0.6225    
Species[T.WP]             1.413e-01  1.510e-02   9.357 9.81e-13 ***
Fork.Length               4.160e-04  9.679e-05   4.298 7.59e-05 ***
Sex[T.M]                 -1.712e-02  1.308e-02  -1.309   0.1964    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.04714 on 52 degrees of freedom
Multiple R-squared:   0.73,	Adjusted R-squared:  0.704 
F-statistic: 28.11 on 5 and 52 DF,  p-value: 1.123e-13
```

SELENIUM

```
lm(formula = Selenium ~ treatment + Species + Fork.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.15300 -0.04767 -0.01298  0.05298  0.17973 

Coefficients:
                           Estimate Std. Error t value Pr(>|t|)    
(Intercept)               0.4863306  0.0607723   8.003 1.26e-10 ***
treatment[T.Reference] -0.0629299  0.0193039  -3.260 0.001968 ** 
Species[T.RB]            -0.0600060  0.0245862  -2.441 0.018104 *  
Species[T.WP]            -0.0925424  0.0234253  -3.951 0.000236 ***
```

```
Fork.Length                 0.0001031  0.0001502   0.687 0.495340    
Sex[T.M]                    0.0728422  0.0202926   3.590 0.000733 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.07314 on 52 degrees of freedom
Multiple R-squared:  0.4053,	Adjusted R-squared:  0.3481 
F-statistic: 7.088 on 5 and 52 DF,  p-value: 4.049e-05
```

THALLIUM

```
lm(formula = Thallium ~ treatment + Species + Fork.Length + Sex)

Residuals:
       Min         1Q     Median         3Q        Max 
-0.0121766 -0.0031669 -0.0005923  0.0017234  0.0180570 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             1.509e-03  5.139e-03   0.294  0.77012    
treatment[T.Reference] -4.854e-04  1.632e-03  -0.297  0.76737    
Species[T.RB]           5.876e-03  2.079e-03   2.826  0.00666 ** 
Species[T.WP]           1.236e-02  1.981e-03   6.241    8e-08 ***
Fork.Length             1.089e-05  1.270e-05   0.858  0.39486    
Sex[T.M]                2.520e-03  1.716e-03   1.468  0.14803    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.006185 on 52 degrees of freedom
Multiple R-squared:  0.4651,	Adjusted R-squared:  0.4136 
F-statistic: 9.041 on 5 and 52 DF,  p-value: 3.12e-06
```

ZINC

```
lm(formula = Zinc ~ treatment + Species + Fork.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.1579 -1.5315 -0.3079  1.4523  6.5558 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)            10.2399132  1.9206303   5.332 2.14e-06 ***
treatment[T.Reference]  0.0006911  0.6100759   0.001    0.999    
Species[T.RB]          -0.0703834  0.7770147  -0.091    0.928    
Species[T.WP]          -0.5852990  0.7403254  -0.791    0.433    
Fork.Length            -0.0017791  0.0047460  -0.375    0.709    
Sex[T.M]                0.6063249  0.6413226   0.945    0.349    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.312 on 52 degrees of freedom
Multiple R-squared:  0.03682,	Adjusted R-squared:  -0.05579 
F-statistic: 0.3976 on 5 and 52 DF,  p-value: 0.8483
```

LARGE BODY FISH WHOLE BODY ANCOVA RESULTS:

ARSENIC

```
lm(formula = log(Arsenic) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.2186 -0.3717  0.0649  0.3776  0.9010 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)            -1.967842   0.429152  -4.585 3.48e-05 ***
treatment[T.Reference]  0.157934   0.155727   1.014   0.3158    
Species[T.RB]           0.100948   0.192717   0.524   0.6029    
Species[T.WP]           0.047564   0.200534   0.237   0.8136    
Fork.Length            -0.002063   0.001041  -1.981   0.0536 .  
Sex[T.M]               -0.251893   0.168535  -1.495   0.1418    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5568 on 46 degrees of freedom
Multiple R-squared:  0.1215,   Adjusted R-squared:  0.02599 
F-statistic: 1.272 on 5 and 46 DF,  p-value: 0.2921
```

CADMIUM

```
lm(formula = Cadmium ~ treatment + Species + Fork.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.020780 -0.006995 -0.002409  0.005657  0.048143 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             2.032e-02  9.186e-03   2.212  0.03200 *  
treatment[T.Reference] -1.030e-02  3.333e-03  -3.090  0.00339 ** 
Species[T.RB]          -1.974e-02  4.125e-03  -4.786 1.80e-05 ***
Species[T.WP]          -1.953e-02  4.292e-03  -4.549 3.92e-05 ***
Fork.Length             3.168e-05  2.229e-05   1.421  0.16197    
Sex[T.M]               -1.870e-03  3.607e-03  -0.518  0.60661    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.01192 on 46 degrees of freedom
Multiple R-squared:  0.4613,   Adjusted R-squared:  0.4028 
F-statistic: 7.879 on 5 and 46 DF,  p-value: 2.001e-05
```

CHROMIUM

```
lm(formula = log(Chromium) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-1.1650 -0.7288 -0.3845 -0.0059  4.8152 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)            -8.9372229  1.1713609  -7.630 1.04e-09 ***
treatment[T.Reference]  0.3170077  0.4250547   0.746    0.460    
Species[T.RB]           0.3838855  0.5260164   0.730    0.469    
```

```
Species[T.WP]           -0.5557225  0.5473533  -1.015    0.315
Fork.Length              0.0005379  0.0028422   0.189    0.851
Sex[T.M]                -0.1814263  0.4600114  -0.394    0.695
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.52 on 46 degrees of freedom
Multiple R-squared:  0.08002, Adjusted R-squared:  -0.01998
F-statistic: 0.8002 on 5 and 46 DF,  p-value: 0.5553
```

COPPER

```
lm(formula = log(Copper) ~ treatment + Species + Fork.Length +
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max
-0.37090 -0.13655 -0.01628  0.12233  0.60550

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)
(Intercept)            -0.5962252  0.1658153  -3.596 0.000786 ***
treatment[T.Reference]  0.1122009  0.0601698   1.865 0.068606 .
Species[T.RB]           0.0747919  0.0744618   1.004 0.320424
Species[T.WP]          -0.3441882  0.0774822  -4.442 5.56e-05 ***
Fork.Length            -0.0011352  0.0004023  -2.822 0.007032 **
Sex[T.M]                0.0036628  0.0651182   0.056 0.955388
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2151 on 46 degrees of freedom
Multiple R-squared:  0.575,    Adjusted R-squared:  0.5288
F-statistic: 12.45 on 5 and 46 DF,  p-value: 1.165e-07
```

IRON

```
lm(formula = Iron ~ treatment + Species + Fork.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max
-6.8077 -1.4663  0.0367  1.1227  9.5559

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)
(Intercept)             4.988583   2.094704   2.382  0.02144 *
treatment[T.Reference]  0.997033   0.760111   1.312  0.19613
Species[T.RB]          -0.835140   0.940657  -0.888  0.37925
Species[T.WP]          -2.722782   0.978813  -2.782  0.00781 **
Fork.Length             0.011729   0.005083   2.308  0.02556 *
Sex[T.M]               -0.575299   0.822622  -0.699  0.48786
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.718 on 46 degrees of freedom
Multiple R-squared:  0.2323,  Adjusted R-squared:  0.1489
F-statistic: 2.784 on 5 and 46 DF,  p-value: 0.02805

> summary(whole.pb.lm)
```

LEAD

```
lm(formula = log(Lead) ~ treatment + Species + Fork.Length +
```

```
    Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-4.5239 -0.5396  0.1588  0.9915  2.0288 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             -4.395245   1.163840  -3.777 0.000455 ***
treatment[T.Reference] -2.124164   0.422326  -5.030 7.96e-06 ***
Species[T.RB]           -0.633625   0.522639  -1.212 0.231566    
Species[T.WP]           -1.421687   0.543839  -2.614 0.012050 *  
Fork.Length              0.004588   0.002824   1.625 0.111056    
Sex[T.M]                 0.924508   0.457058   2.023 0.048936 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.51 on 46 degrees of freedom
Multiple R-squared:  0.438,	Adjusted R-squared:  0.377 
F-statistic: 7.171 on 5 and 46 DF,  p-value: 4.933e-05
```

MERCURY

```
lm(formula = Mercury ~ treatment + Species + Fork.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.053912 -0.020790 -0.004777  0.013269  0.094555 

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)    
(Intercept)             -2.567e-02  2.497e-02  -1.028 0.309331    
treatment[T.Reference]  1.841e-02  9.061e-03   2.031 0.048006 *  
Species[T.RB]           -9.176e-03  1.121e-02  -0.818 0.417390    
Species[T.WP]            9.706e-02  1.167e-02   8.319 1.01e-10 ***
Fork.Length              2.350e-04  6.058e-05   3.879 0.000332 ***
Sex[T.M]                -2.048e-02  9.806e-03  -2.088 0.042341 *  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.03239 on 46 degrees of freedom
Multiple R-squared:  0.7888,	Adjusted R-squared:  0.7658 
F-statistic: 34.36 on 5 and 46 DF,  p-value: 1.881e-14
```

SELENIUM

```
lm(formula = Selenium ~ treatment + Species + Fork.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.33977 -0.08363  0.00172  0.08528  0.53883 

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)    
(Intercept)              6.564e-01  1.307e-01   5.023 8.14e-06 ***
treatment[T.Reference] -8.852e-02  4.742e-02  -1.867 0.068298 .  
Species[T.RB]           -2.468e-01  5.868e-02  -4.206 0.000119 ***
Species[T.WP]           -2.734e-01  6.106e-02  -4.478 4.95e-05 ***
Fork.Length              4.935e-05  3.171e-04   0.156 0.876996    
Sex[T.M]                 1.684e-01  5.132e-02   3.281 0.001979 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
Residual standard error: 0.1695 on 46 degrees of freedom
Multiple R-squared:  0.498,	Adjusted R-squared:  0.4434 
F-statistic: 9.127 on 5 and 46 DF,  p-value: 4.387e-06
```

THALLIUM

```
lm(formula = Thallium ~ treatment + Species + Fork.Length + Sex)

Residuals:
       Min         1Q     Median         3Q        Max 
-0.0127112 -0.0044966 -0.0001399  0.0029002  0.0181793 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             3.166e-02  4.398e-03   7.198 4.60e-09 ***
treatment[T.Reference] -5.983e-03  1.596e-03  -3.749 0.000495 ***
Species[T.RB]           4.205e-03  1.975e-03   2.129 0.038634 *  
Species[T.WP]           1.410e-02  2.055e-03   6.860 1.48e-08 ***
Fork.Length            -5.489e-05  1.067e-05  -5.143 5.43e-06 ***
Sex[T.M]               -5.683e-03  1.727e-03  -3.290 0.001927 ** 
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.005706 on 46 degrees of freedom
Multiple R-squared:  0.6163,	Adjusted R-squared:  0.5746 
F-statistic: 14.78 on 5 and 46 DF,  p-value: 1.223e-08
```

ZINC

```
lm(formula = Zinc ~ treatment + Species + Fork.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-6.6075 -2.6675 -0.7708  2.3844  9.8423 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)            19.472169   2.914610   6.681 2.75e-08 ***
treatment[T.Reference]  1.809042   1.057632   1.710  0.09392 .  
Species[T.RB]           0.192610   1.308847   0.147  0.88365    
Species[T.WP]          -0.813107   1.361938  -0.597  0.55342    
Fork.Length            -0.019192   0.007072  -2.714  0.00933 ** 
Sex[T.M]               -0.633230   1.144612  -0.553  0.58279    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.781 on 46 degrees of freedom
Multiple R-squared:  0.243,	Adjusted R-squared:  0.1607 
F-statistic: 2.953 on 5 and 46 DF,  p-value: 0.0215
```

LARGE BODY FISH GUT CONTENT ANCOVA RESULTS:

ARSENIC

```
lm(formula = log(Arsenic) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.46863 -0.47805 -0.03212  0.49936  1.83272 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)            -0.652215   0.647916  -1.007  0.31938    
treatment[T.Reference] -0.474585   0.235111  -2.019  0.04939 *  
Species[T.RB]           0.845473   0.290956   2.906  0.00562 ** 
Species[T.WP]           1.354850   0.302758   4.475 4.99e-05 ***
Fork.Length            -0.004914   0.001572  -3.126  0.00307 ** 
Sex[T.M]               -0.092840   0.254447  -0.365  0.71688    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.8406 on 46 degrees of freedom
Multiple R-squared:  0.369,	Adjusted R-squared:  0.3004 
F-statistic: 5.379 on 5 and 46 DF,  p-value: 0.0005633
```

CADMIUM

```
lm(formula = Cadmium ~ treatment + Species + Fork.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.23926 -0.07257 -0.01081  0.05962  0.45858 

Coefficients:
                         Estimate  Std. Error t value Pr(>|t|)    
(Intercept)             0.5172677  0.1007031   5.137 6.13e-06 ***
treatment[T.Reference] -0.1677514  0.0361201  -4.644 3.09e-05 ***
Species[T.RB]           0.0442985  0.0442242   1.002 0.321975    
Species[T.WP]           0.0999367  0.0457936   2.182 0.034467 *  
Fork.Length            -0.0008462  0.0002393  -3.536 0.000969 ***
Sex[T.M]               -0.0061508  0.0382324  -0.161 0.872926    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1252 on 44 degrees of freedom
Multiple R-squared:  0.4268,	Adjusted R-squared:  0.3616 
F-statistic: 6.552 on 5 and 44 DF,  p-value: 0.0001235
```

CHROMIUM

```
lm(formula = log(Chromium) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-6.0081 -1.6794  0.1035  1.3254  5.1706 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)   
(Intercept)            -1.913863   2.040619  -0.938  0.35320   
treatment[T.Reference] -2.023180   0.740484  -2.732  0.00889 **
```

```
Species[T.RB]           2.012262   0.916369   2.196  0.03318 * 
Species[T.WP]          -3.103541   0.953540  -3.255  0.00213 **
Fork.Length            -0.006006   0.004951  -1.213  0.23131   
Sex[T.M]                0.543473   0.801382   0.678  0.50106   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.647 on 46 degrees of freedom
Multiple R-squared:  0.4904,	Adjusted R-squared:  0.435 
F-statistic: 8.852 on 5 and 46 DF,  p-value: 6.084e-06
```

COPPER

```
lm(formula = log(Copper) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.70253 -0.53897  0.03981  0.30581  2.06707 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)             3.016648   0.612307   4.927 1.12e-05 ***
treatment[T.Reference] -0.592586   0.222190  -2.667   0.0105 *  
Species[T.RB]           2.412257   0.274965   8.773 2.20e-11 ***
Species[T.WP]           0.405484   0.286119   1.417   0.1632    
Fork.Length            -0.006898   0.001486  -4.643 2.88e-05 ***
Sex[T.M]               -0.381410   0.240462  -1.586   0.1196    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.7944 on 46 degrees of freedom
Multiple R-squared:  0.7144,	Adjusted R-squared:  0.6833 
F-statistic: 23.01 on 5 and 46 DF,  p-value: 1.695e-11
```

IRON

```
lm(formula = log(Iron) ~ treatment + Species + Fork.Length + 
    Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.79166 -0.63564  0.07082  0.46189  2.30593 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)             6.038236   0.749881   8.052    4e-10 ***
treatment[T.Reference] -0.622461   0.271881  -2.289  0.02702 *  
Species[T.RB]           0.989871   0.333760   2.966  0.00491 ** 
Species[T.WP]           0.074921   0.340695   0.220  0.82699    
Fork.Length            -0.004720   0.001782  -2.649  0.01125 *  
Sex[T.M]               -0.139423   0.290040  -0.481  0.63316    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9311 on 43 degrees of freedom
Multiple R-squared:  0.3474,	Adjusted R-squared:  0.2716 
F-statistic: 4.579 on 5 and 43 DF,  p-value: 0.001952
```

LEAD

```
lm(formula = log(Lead) ~ treatment + Species + Fork.Length + 
    Sex)
```

```
Residuals:
    Min      1Q  Median      3Q     Max 
-5.2381 -0.7585  0.1433  0.9620  2.3811 

Coefficients:
                        Estimate Std. Error t value Pr(>|t|)    
(Intercept)             1.792914   1.285852   1.394  0.16991    
treatment[T.Reference] -3.638906   0.466600  -7.799 5.86e-10 ***
Species[T.RB]           1.557891   0.577430   2.698  0.00972 ** 
Species[T.WP]          -1.291759   0.600853  -2.150  0.03686 *  
Fork.Length            -0.008994   0.003120  -2.883  0.00597 ** 
Sex[T.M]                0.608042   0.504974   1.204  0.23471    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.668 on 46 degrees of freedom
Multiple R-squared:  0.6814,	Adjusted R-squared:  0.6468 
F-statistic: 19.68 on 5 and 46 DF,  p-value: 1.95e-10
```

MERCURY

```
lm(formula = Mercury ~ treatment + Species + Fork.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.016571 -0.010794 -0.001937  0.006791  0.043383 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             4.288e-02  1.200e-02   3.574 0.000884 ***
treatment[T.Reference]  6.838e-03  4.388e-03   1.558 0.126505    
Species[T.RB]           1.329e-02  5.528e-03   2.405 0.020561 *  
Species[T.WP]           1.597e-02  5.771e-03   2.768 0.008292 ** 
Fork.Length            -5.859e-05  2.987e-05  -1.961 0.056341 .  
Sex[T.M]               -6.380e-03  4.728e-03  -1.349 0.184261    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.01516 on 43 degrees of freedom
Multiple R-squared:  0.2256,	Adjusted R-squared:  0.1356 
F-statistic: 2.506 on 5 and 43 DF,  p-value: 0.04461
```

SELENIUM

```
lm(formula = Selenium ~ treatment + Species + Fork.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.21902 -0.38470 -0.04951  0.37387  1.69957 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             2.4997940  0.4772763   5.238 4.38e-06 ***
treatment[T.Reference] -0.8698893  0.1666736  -5.219 4.66e-06 ***
Species[T.RB]          -0.1869540  0.2150221  -0.869   0.3893    
Species[T.WP]          -1.3177137  0.2125467  -6.200 1.72e-07 ***
Fork.Length             0.0007686  0.0011846   0.649   0.5198    
Sex[T.M]               -0.3138755  0.1830250  -1.715   0.0934 .  
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.584 on 44 degrees of freedom
Multiple R-squared:  0.6515,	Adjusted R-squared:  0.6119 
```

```
F-statistic: 16.45 on 5 and 44 DF,  p-value: 3.889e-09
```

THALLIUM

```
lm(formula = Thallium ~ treatment + Species + Fork.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.021944 -0.006528 -0.001544  0.005694  0.025362 

Coefficients:
                         Estimate Std. Error t value Pr(>|t|)    
(Intercept)             0.0571191  0.0089195   6.404 8.59e-08 ***
treatment[T.Reference] -0.0077291  0.0031333  -2.467 0.017599 *  
Species[T.RB]           0.0100342  0.0039020   2.572 0.013580 *  
Species[T.WP]           0.0151477  0.0040705   3.721 0.000559 ***
Fork.Length            -0.0001035  0.0000219  -4.726 2.37e-05 ***
Sex[T.M]               -0.0020226  0.0034460  -0.587 0.560238    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.01095 on 44 degrees of freedom
Multiple R-squared:  0.4276,   Adjusted R-squared:  0.3626 
F-statistic: 6.574 on 5 and 44 DF,  p-value: 0.00012
```

ZINC

```
lm(formula = Zinc ~ treatment + Species + Fork.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-43.503 -12.756  -6.034  11.066  85.148 

Coefficients:
                       Estimate Std. Error t value Pr(>|t|)    
(Intercept)            106.9029    20.5831   5.194 5.35e-06 ***
treatment[T.Reference] -15.2984     7.2710  -2.104   0.0413 *  
Species[T.RB]           40.3188     9.2171   4.374 7.62e-05 ***
Species[T.WP]          -24.5306     9.2429  -2.654   0.0111 *  
Fork.Length             -0.1236     0.0501  -2.466   0.0177 *  
Sex[T.M]                -2.2374     8.0078  -0.279   0.7813    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 25.24 on 43 degrees of freedom
Multiple R-squared:  0.6101,   Adjusted R-squared:  0.5648 
F-statistic: 13.46 on 5 and 43 DF,  p-value: 6.509e-08
```

APPENDIX I

SMALL-BODIED FISH COLLECTION AND TISSUE METALS DATA AND ANCOVA RESULTS FOR SCULPIN TISSUE CHEMISTRY AND CONDITION

Small Body Fish Sampling

Sample No.	Area	Local Identifier	Dist_frm_CII(m)	Upstream UTM East	Upstream UTM North	Downstream UTM East	Downstream UTM North	Bank	Sub_Fines	Sub_Gravel	Sub_Cobble	Sub_Boulder	Embeddedness	D50	Ave_Velocity	Water Temp.	pH	EC	TDS	Date	Species	Total Length (mm)	Fork Length (mm)	Field Weight (g)	Lab Weight (g)	Liver Weight (g)	Gut Weight (g)	Gonad Weight (g)	Preserved	otolith Taken	Sex (m/f/u)	Age (yrs)	Comments	Condition	Liversomatic Index	Gonadosomatic Index
21	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	105		17	16.79	0.25	0.95	0.2	Y	Y	M	4+		1.450	1.489	1.191
22	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	85		8	7.4	0.1	0.5		Y	Y	M	3+		1.205	1.351	
23	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	80		9	8.45	0.14	1.15	0.06	Y	Y	M	3+		1.650	1.657	0.710
24	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	80		7	6.28	0.11	0.76	0.03	Y	Y	F	3+		1.227	1.752	0.478
25	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	85		8	8.2	0.13	0.7		Y	Y	M	4+		1.335	1.585	
26	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	65		4	3.91	0.04	0.3		Y	Y	M	2+		1.424	1.023	
27	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	66		3	3.61	0.05	0.27		Y	Y	U	2+		1.256	1.385	
28	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	65		3	2.5	0.03	0.14		Y	Y	U	2+		0.910	1.200	
38	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	85		7	7.34	0.06	0.59	0.02	Y	Y	M	3+		1.195	0.817	0.272
39	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	102		14	14.93	0.17	0.62	3.37	Y	Y	F	3+		1.407	1.139	22.572
40	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	88		8	7.94	0.13	0.72		Y	Y	U	3+		1.165	1.637	
43	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	78		6	6.65	0.06	0.54		Y	Y	U	3+		1.401	0.902	
44	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	76		2	4.45	0.07	0.31		Y	Y	U	2+		1.014	1.573	
45	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	71		4	4.22	0.04	0.22		Y	Y	U	2+		1.179	0.948	
47	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	48		1	1.11	<0.01	0.05		Y	Y	U	1+		1.004		
49	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	49		1	1.07	0.01	0.06		Y	Y	U	1+		0.909	0.935	
50	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	47		1	1.06	<0.01	0.06		Y	Y	U	1+		1.021		
55	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	94		13	12.15	0.25	0.56	0.35	Y	Y	M	4+		1.463	2.058	2.881
56	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	115		30	28.8	0.74	1.72	0.18	Y	Y	M	4+		1.894	2.569	0.625
57	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	111		22	21.19	0.33	0.86	0.11	Y	Y	M	4+		1.549	1.557	0.519
58	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	90		9	8.61	0.05	0.69	0.08	Y	Y	M	3+		1.181	0.581	0.929
59	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	117		18	17.1	0.37	0.78	4.04	Y	Y	F	4+		1.068	2.164	23.626
60	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	83		8	7.45	0.09	0.45	0.06	Y	Y	M	3+		1.303	1.208	0.805
61	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	80		7	7.44	0.25	0.28	1.3	Y	Y	F	3+		1.453	3.360	17.473
62	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	75		5	4.96	0.05	0.29		Y	Y	M	3+		1.176	1.008	
63	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	75		6	4.97	0.05	0.3	0.03	Y	Y	M	no sample		1.178	1.006	0.604
64	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	78		7	7.04	0.08	0.37	0.1	Y	Y	M	3+		1.484	1.136	1.420
65	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	8.7	7.98	110	54	5/13/2013	CRH	80		6	6.31	0.1	0.25	0.09	Y	Y	M	3+	Cysts in liver - Photo 0180	1.232	1.585	1.426
66	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	70		4	3.91	0.05	0.2		Y	Y	U	2+		1.140	1.279	
67	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	46		2	1.01	<0.01	0.05		Y	Y	U	1+		1.038		
68	Koot-Ref	Kootenay	-28815	453850	5463750	453300	5462600	L	0	10	40	50	0-25	35	0.6	9.9	7.98	110	54	5/13/2013	CRH	49		2	1.14	<0.01	0.05		Y	Y	U	1+		0.969		
70	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	83		8	7.77	0.2	0.22	1.14	Y	Y	F	3+	Gravid	1.359	2.574	14.672
72	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	95		12	10.64	0.08	0.84	0.15	Y	Y	M	3+	Liver soft with red mottling	1.241	0.752	1.410
73	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CAS	80		6	5.91	0.17	0.23	0.57	Y	Y	F	3+		1.154	2.876	9.645
74	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	79		6	6.13	0.08	0.45	0.02	Y	Y	F	4+		1.243	1.305	0.326
75	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	69		3	2.76	0.04	0.19		Y	Y	U	3+		0.840	1.449	
77	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CAS	100		14	13.43	0.39	0.73	1.78	Y	Y	F	4+		1.343	2.904	13.254
78	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	92		10	9.64	0.07	0.36	0.25	Y	Y	M	4+		1.238	0.726	2.593
79	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	85		8	7.81	0.23	0.15	0.16	Y	Y	F	3+	Cysts in liver	1.272	2.945	2.049
82	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CAS	84		7	6.87	0.06	0.23	0.18	Y	Y	M	no sample		1.159	0.873	2.620
83	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	79		8	7.23	0.22	0.25	1.32	Y	Y	F	3+		1.466	3.043	18.257
84	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	75		6	4.9	0.06	0.26		Y	Y	M	3+		1.161	1.224	
86	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	82		7	7.11	0.15	0.22	1.06	Y	Y	F	3+		1.290	2.110	14.909
87	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	81		8	8.1	0.07	0.27	0.17	Y	Y	M	3+		1.524	0.864	2.099
89	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	88		10	8.41	0.2	0.32	1.8	Y	Y	F	3+	Gravid	1.234	2.378	21.403
92	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CAS	96		10	9.57	0.07	0.34	0.28	Y	Y	M	4+		1.082	0.731	2.926
97	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	81		6	5.8	0.07	0.38		Y	Y	M	3+		1.091	1.207	
98	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	83		7	6.87	0.07	0.28	0.13	Y	Y	M	3+		1.201	1.019	1.892
99	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	70		5	4.17	0.03	0.24		Y	Y	F	3+		1.216	0.719	
100	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	65		3	3.34	0.06	0.11		Y	Y	F	2+		1.216	1.796	
101	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	89		8	7.56	0.08	0.31	0.12	Y	Y	M	3+		1.072	1.058	1.587
103	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CAS	85		6	6.18	0.16	0.35	0.62	Y	Y	F	4+		1.006	2.589	10.032
104	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	70		4	3.99	0.09	0.21		Y	Y	F	3+		1.163	2.256	
109	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	65		4	3.07	0.03	0.18		Y	Y	F	3+	Cysts in liver	1.118	0.977	
110	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	65		3	2.89	<0.01	0.16		Y	Y	F	2+		1.052		
112	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	76		6	5.9	0.12	0.13	1.27	Y	Y	F	4+		1.344	2.034	21.525
117	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	50		3	1.3	0.02	0.06		Y	Y	U	2+		1.040	1.538	
118	Ero-Ref-2	Birchbank	-8940	447630	5446950	447630	5446660	R	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	51		3	1.54	0.04	0.09		Y	Y	U	1+		1.161	2.597	
131	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	100		13	11.92	0.1		0.12	Y	Y	M	4+		1.192	0.839	1.007
132	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	75		6	5.34	0.09	0.35		Y	Y	F	3+		1.266	1.685	
133	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	62		3	2.73	0.07	0.24		Y	Y	U	2+		1.145	2.564	
134	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	85		8	7.17	0.06	0.26	0.13	Y	Y	M	4+		1.168	0.837	1.813
136	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	66		5	5.14	0.14	0.1	1.23	Y	Y	F	3+	Gravid	1.788	2.724	23.930
138	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	57		3	2.12	<0.01	0.12	0.03	Y	Y	M	3+		1.145		1.415
140	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	10.5	8.04	111	55	5/14/2013	CRH	69		6	5.75	0.04	0.19	0.13	Y	Y	M	3+		1.750	0.696	2.261
149	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	42		1	0.84	<0.01	0.06		Y	Y	U	1+		1.134		
153	Ero-Ref-2	Birchbank	-8940	447885	5447160	447885	5447050	L	0	5	85	10	0-25	25	0.7	9.9	8.04	111	55	5/14/2013	CRH	44		1	0.97	0.01	0.06		Y	Y	U	1+		1.139	1.031	
162	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	98		12	10.55	0.18	0.19		Y	Y	F	3+		1.121	1.706	
163	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	68		4	2.89	0.09	0.29		Y	Y	F	3+		0.919	3.114	
164	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	60		2	2.25	0.02	0.12		Y	Y	M	2+		1.042	0.889	
165	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	71		5	5.15	0.13	0.14	0.88	Y	Y	F	3+	Gravid	1.439	2.524	17.087
166	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	80		8	7.2	0.15	0.26	0.12	Y	Y	M	4+		1.406	2.083	1.667
167	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	89		9	9.32	0.09	0.41	0.21	Y	Y	M	3+		1.322	0.966	2.253
169	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	73		4	4.09	0.04	0.26		Y	Y	M	3+		1.051	0.978	
170	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	72		5	4.68	0.06	0.28		Y	Y	M	4+		1.254	1.282	
171	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	81		8	7.34	0.13	0.33	0.13	Y	Y	M	4+		1.381	1.771	1.771
172	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	57		2	2.43	0.02	0.18		Y	Y	M	2+		1.312	0.823	
173	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	71		4	4.32	0.03	0.17	0.07	Y	Y	M	3+		1.207	0.694	1.620
174	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	73		5	4.45	0.1	0.3		Y	Y	F	3+		1.144	2.247	
175	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	80		6	5.84	0.08	0.39		Y	Y	M	3+	White spots on liver	1.141	1.370	
176	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	66		4	3.13	0.04	0.13		Y	Y	F	3+		1.089	1.278	
177	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	68		3	3.61	0.04	0.18		Y	Y	M	2+		1.148	1.108	
178	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	60		2	2.54	0.03	0.14		Y	Y	U	2+		1.176	1.181	
188	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	72		7	7	0.19	0.17	1.88	Y	Y	F	4+	Cysts on liver; Gravid	1.875	2.714	26.857
189	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	57		3	2.45	0.02	0.14		Y	Y	U	2+		1.323	0.816	
194	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	69		5	4.71	0.15	0.12	0.76	Y	Y	F	3+		1.434	3.185	16.136
197	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	55		2	2.17	0.04	0.1		Y	Y	U	2+		1.304	1.843	
198	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	62		3	3.13	0.09	0.17	0.32	Y	Y	F	2+		1.313	2.875	10.224
200	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	60		2	2.01	0.04	0.09		Y	Y	U	2+	White spots on liver	0.931	1.990	
201	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	59		2	2.24	0.02	0.1		Y	Y	U	2+		1.091	0.893	
202	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CAS	55		1	1.51	<0.01	0.1		Y	Y	U	2+		0.908		
203	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	60		2	2.42	0.01	0.09		Y	Y	U	3+	White spots on liver	1.120	0.413	
204	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CRH	65		3	3.12	0.03	0.2		Y	Y	F	3+		1.136	0.962	
205	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	46		2	1.21	<0.01	0.08		Y	Y	U	1+		1.243		
206	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	61		3	2.7	<0.01	0.12		Y	Y	U	3+		1.190		
208	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	62		2	2.66	0.03	0.18		Y	Y	U	3+		1.116	1.128	
209	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	40		1	0.77	0.02	0.07		Y	Y	U	1+		1.203	2.597	
210	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.9	8.14	113	55	5/14/2013	CRH	55		2	1.84	<0.01	0.09		Y	Y	U	2+		1.106		
211	Ero-Exp-1	Stoney Creek	-1500	447145	5440490	447890	5439500	R	0	15	75	10	0-25	15	0.6	9.8	8.14	113	55	5/14/2013	CAS	59		2	2.05	0.03	0.1		Y	Y	U	2+		0.998	1.463	
228	Ero-Exp-2	TTS	50	447920	5439275	448050	5439020	R	0	10	80	10	0-25	15	0.7	9.7	8.04	118	59	5/14/2013	CRH	89		9	8.86	0.15	0.37	0.12	Y	Y	M	3+		1.257	1.693	1.354
229	Ero-Exp-2	TTS	50	447920	5439275	448050	5439020	R	0	10	80	10	0-25	15	0.7	9.7	8.04	118	59	5/14/2013	CRH	60		3	3.29	0.04	0.13		Y	Y	F	3+		1.523	1.216	
230	Ero-Exp-2	TTS	50	447920	5439275	448050	5439020	R	0	10	80	10	0-25	15	0.7	9.7	8.04	118	59	5/14/2013	CRH	75		7	6.64	0.13	0.19	1.19	Y	Y	F	3+	Gravid	1.574	1.958	17.922
232	Ero-Exp-2	TTS	50	447920	5439275	448050	5439020	R	0	10	80	10	0-25	15	0.7	9.9	8.04	118	59	5/14/2013	CRH	65		3	3.1	0.02	0.13		Y	Y	U	2+		1.129	0.645	
235	Ero-Exp-2	TTS	50	447920	5439275	448050	5439020	R	0	10	80	10	0-25	15	0.7	9.9	8.04	118	59	5/14/2013	CRH	60		3	2.48	0.02	0.13		Y	Y	U	2+		1.148	0.806	
241	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	77		6	4.96	0.08	0.3		Y	Y	F	3+		1.086	1.613	
242	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	82		6	6.49	0.14	0.45		Y	Y	F	3+	Black spots on liver	1.177	2.157	
244	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	65		3	3.54	0.05	0.24		Y	Y	M	2+	White spots on liver	1.289	1.412	
245	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	79		6	5.52	0.14	0.17	0.91	Y	Y	F	3+		1.120	2.536	16.486
246	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	70		6	5.11	0.12	0.23	0.66	Y	Y	F	3+		1.490	2.348	12.916
248	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.9	8.09	119	58	5/15/2013	CRH	56		2	2.08	0.02	0.13		Y	Y	U	2+		1.184	0.962	
249	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.9	8.09	119	58	5/15/2013	CRH	64		3	2.28	0.03	0.11		Y	Y	U	2+		0.870	1.316	
255	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	70		6	5.3	0.1	0.22	0.07	Y	Y	M	2+		1.545	1.887	1.321
257	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	66		5	4.94	0.1	0.11	1.01	Y	Y	F	2+		1.718	2.024	20.445
262	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	60		3	1.99	<0.01	0.1		Y	Y	M	2+		0.921		

Small Body Fish Sampling

Sample No.	Area	Local Identifier	Dist_frm_CII(m)	Upstream UTM East	Upstream UTM North	Downstream UTM East	Downstream UTM North	Bank	Sub_Fines	Sub_Gravel	Sub_Cobble	Sub_Boulder	Embeddedness	D50	Ave_Velocity	Water Temp.	pH	EC	TDS	Date	Species	Total Length (mm)	Fork Length (mm)	Field Weight (g)	Lab Weight (g)	Liver Weight (g)	Gut Weight (g)	Gonad Weight (g)	Preserved	otolith Taken	Sex (m/f/u)	Age (yrs)	Comments	Condition	Liversomatic Index	Gonadosomatic Index
263	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CRH	55		2	2.04	0.02	0.12		Y	Y	M	2+		1.226	0.980	
267	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.9	8.09	119	58	5/15/2013	CRH	50		2	1.03	0.01	0.04		Y	Y	U	2+		0.824	0.971	
268	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.9	8.09	119	58	5/15/2013	CRH	59		3	2.12	0.03	0.13		Y	Y	U	2+		1.032	1.415	
270	Ero-Exp-2	TTS	165	4482220	5438715	448284	5438640	R	0	20	75	5	0-25	15	0.7	9.8	8.09	119	58	5/15/2013	CAS	56		2	1.79	0.01	0.09		Y	Y	U	2+		1.019	0.559	
284	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	105		17	16.31	0.23	0.72	0.4	Y	Y	M	5+		1.409	1.410	2.452
285	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	118		27	26.75	0.78	1.02	5.26	Y	Y	F	5+	Very gravid; spots on liver	1.628	2.916	19.664
286	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	67		3	3.52	0.1	0.1	0.68	Y	Y	F	3+		1.170	2.841	19.318
287	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	80		5	5.62	0.08	0.37		Y	Y	F	4+	White spots on liver	1.098	1.423	
288	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	70		4	4.19	0.05	0.16		Y	Y	F	3+	White spots on liver	1.222	1.193	
289	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	75		5	4.73	0.05	0.22		Y	Y	M	3+	White spots on liver	1.121	1.057	
290	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	73		4	4.25	0.06	0.25		Y	Y	F	3+		1.092	1.412	
291	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	61		2	2.15	0.04	0.19		Y	Y	U	2+	Black spots on liver - photo 0195	0.947	1.860	
292	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	45		1	1.18	0.01	0.1		Y	Y	M	1+	Gravid	1.295	0.847	
293	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	60		2	2.01	0.02	0.11		Y	Y	U	2+		0.931	0.995	
300	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	65		4	3.61	0.05	0.2		Y	Y	M	3+		1.315	1.385	
304	Ero-Exp-2	TTS	160	448330	5438910	448357	5438835	L	0	5	65	30	0-25	25	0.6	9.9	8.08	118	58	5/15/2013	CRH	69		4	3.94	0.07	0.14	0.51	Y	Y	F	3+	Gravid	1.199	1.777	12.944
325	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	80		6	5.85	0.08	0.58		Y	Y	F	3+		1.143	1.368	
327	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	71		4	4.4	0.08	0.29		Y	Y	F	2+		1.229	1.818	
328	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	90		10	9.33	0.14	0.52		Y	Y	M	4+		1.280	1.501	
329	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	63		4	3.78	0.09	0.33		Y	Y	F	2+		1.512	2.381	
330	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	86		10	9.74	0.26	0.62	0.99	Y	Y	F	3+	Gravid	1.531	2.669	10.164
331	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	78		7	7.2	0.16	0.55	0.82	Y	Y	F	3+		1.517	2.222	11.389
332	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	80		8	7.26	0.18	0.19	0.98	Y	Y	F	5+	Gravid	1.418	2.479	13.499
333	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	85		8	7.94	0.06	0.26	0.13	Y	Y	M	4+		1.293	0.756	1.637
334	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	84		6	6.15	0.09	0.3		Y	Y	F	3+		1.038	1.463	
335	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	66		4	3.48	0.08	0.26		Y	Y	F	3+		1.210	2.299	
336	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	61		3	2.59	0.03	0.14		Y	Y	U	2+		1.141	1.158	
337	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	80		8	7.34	0.11	0.43	0.15	Y	Y	M	4+		1.434	1.499	2.044
339	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	75		5	4.77	0.1	0.32		Y	Y	M	3+	Black spots on liver - Photo 0192	1.131	2.096	
340	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	45		1	1.12	0.01	0.07		Y	Y	U	1+		1.229	0.893	
342	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	65		3	2.91	0.01	0.13		Y	Y	U	3+		1.060	0.344	
343	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	70		4	4	0.04	0.18		Y	Y	M	3+		1.166	1.000	
344	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	55		2	1.9	0.03	0.09		Y	Y	U	2+		1.142	1.579	
346	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	70		4	4.13	0.07	0.23		Y	Y	M	3+		1.204	1.695	
347	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	76		5	4.95	0.09	0.39		Y	Y	M	3+		1.128	1.818	
348	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	65		1	1.18	0.01	0.07		Y	Y	U	3+		0.430	0.847	
353	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	56		3	2.3	0.02	0.14		Y	Y	U	2+		1.310	0.870	
356	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	45		1	1.23	0.02	0.09		Y	Y	U	1+		1.350	1.626	
357	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	42		1	0.87	<0.01	0.08		Y	Y	U	1+		1.174		
358	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	50		1	1.42	0.02	0.12		Y	Y	F	1+		1.136	1.408	
363	Ero-Exp-3	McAlister Creek	2525	450363	5438166	450428	5438181	R	0	20	75	5	0-25	20	0.6	9.9	8.08	118	58	5/15/2013	CRH	46		1	1.34	<0.01	0.1		Y	Y	U	1+		1.377		
375	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/15/2013	CRH	60		3	2.55	0.04	0.13		Y	Y	U	3+		1.181	1.569	
376	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	110		21	19.75	0.34	1.43	0.05	Y	Y	M	4+		1.484	1.722	0.253
377	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	60		3	2.74	0.02	0.12		Y	Y	M	2+		1.269	0.730	
379	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	75		6	5.2	0.11	0.15	0.95	Y	Y	F	3+		1.233	2.115	18.269
389	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	79		6	5.96	0.06	0.33	0.06	Y	Y	M	3+		1.209	1.007	1.007
399	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	75		6	5.62	0.14	0.3	0.14	Y	Y	F	3+	Gravid	1.332	2.491	2.491
440	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	105		17	16.04	0.36	0.99	0.12	Y	Y	M	4+	Black spots on liver	1.386	2.244	0.748
441	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	120		25	23.54	0.28	1.2	0.1	Y	Y	M	5+		1.362	1.189	0.425
442	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	106		22	20.38	0.55	0.75	4.64	Y	Y	F	4+	Gravid; Black spots on liver	1.711	2.699	22.767
443	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	95		14	11.34	0.11	0.59	0.05	Y	Y	M	4+		1.323	0.970	0.441
446	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	90		6	8.08	0.07	0.55		Y	Y	F	4+		1.108	0.866	
447	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	105		15	16.15	0.21	0.93	0.18	Y	Y	M	4+	Black spots on liver	1.395	1.300	1.115
451	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	86		5	7.78	0.1	0.37		Y	Y	F	4+		1.223	1.285	
456	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	71		5	4.32	0.07	0.31		Y	Y	M	3+	Black spots on liver	1.207	1.620	
458	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/15/2013	CRH	81		6	6.03	0.07	0.35		Y	Y	M	4+		1.135	1.161	
470	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/15/2013	CRH	40		1	0.8	<0.01	0.06		Y	Y	U	1+		1.250		
471	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/15/2013	CRH	39		<1	0.65	<0.01	0.05		Y	Y	U	1+		1.096		
478	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	124		34	30.21	1.2	1.57	0.19	Y	Y	M	6+		1.584	3.972	0.629
479	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	120		25	23.55	0.54	1.22	0.09	Y	Y	M	5+		1.363	2.293	0.382
480	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	85		8	8.42	0.15	0.32	1.28	Y	Y	F	4+	Gravid	1.371	1.781	15.202
481	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	104		17	17.22	0.36	0.75	2.35	Y	Y	F	4+	Gravid	1.531	2.091	13.647
482	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	130		35	33.72	0.78	2.61	0.23	Y	Y	M	6+	Black spots on liver	1.535	2.313	0.682
483	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	110		25	23.36	0.67	1.8	0.15	Y	Y	M	4+	Black spots on liver	1.755	2.868	0.642
484	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.7	8.21	118	59	5/16/2013	CRH	107		18	15.75	0.45	0.78	0.4	Y	Y	F	4+	White spots on liver	1.286	2.857	2.540
492	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/16/2013	CRH	73		4	4.54	0.07	0.3		Y	Y	U	3+	Black spots on liver	1.167	1.542	
497	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/16/2013	CRH	71		5	4.84	0.06	0.33		Y	Y	U	3+		1.352	1.240	
504	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/16/2013	CRH	68		3	3.2	0.07	0.3		Y	Y	U	3+		1.018	2.188	
510	Ero-Exp-4	Maglios	5500	453184	5437405	453616	5437224	R	0	40	60	0	0	20	0.7	9.9	8.21	118	59	5/16/2013	CRH	39		<1	0.57	<0.01	0.03		Y	Y	U	no sample		0.961		
530	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	84		8	8.81	0.09	0.28	0.13	Y	Y	M	4+		1.486	1.022	1.476
532	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	99		14	13.91	0.24	0.91	0.08	Y	Y	M	4+	Cysts in liver - Photo 0178	1.434	1.725	0.575
533	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	111		26	25.04	0.63	4.2	0.19	Y	Y	M	5+		1.831	2.516	0.759
534	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	86		9	9.16	0.16	0.25	1.94	Y	Y	F	3+		1.440	1.747	21.179
535	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	122		30	27.53	0.77	2.8	0.1	Y	Y	M	5+		1.516	2.797	0.363
537	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	75		6	5.68	0.06	0.41		Y	Y	F	3+		1.346	1.056	
539	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	67		3	4.31	0.1	0.18	0.52	Y	Y	F	3+		1.433	2.320	12.065
541	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	115		28	28.14	0.47	1.26	0.08	Y	Y	M	5+		1.850	1.670	0.284
543	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	102		16	17.68	1.21	2.48	0.05	Y	Y	M	5+		1.666	6.844	0.283
544	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	86		8	8.12	0.07	0.27	0.18	Y	Y	M	4+		1.277	0.862	2.217
548	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	86		9	9.39	0.15	0.68		Y	Y	F	4+		1.476	1.597	
552	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	70		5	5.07	0.1	0.1	0.89	Y	Y	F	4+		1.478	1.972	17.554
563	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	72		5	4.38	0.11	0.16	0.39	Y	Y	F	4+		1.173	2.511	8.904
569	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	63		3	3.19	0.02	0.08	0.06	Y	Y	M	3+		1.276	0.627	1.881
570	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	76		6	5.38	0.05	0.3	0.1	Y	Y	M	3+		1.226	0.929	1.859
572	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	68		4	3.54	0.07	0.18		Y	Y	U	3+	Cysts in liver - Photo 0176	1.126	1.977	
573	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	74		6	5.63	0.14	0.41	0.9	Y	Y	F	3+		1.389	2.487	15.986
576	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	70		5	4.76	0.09	0.08		Y	Y	F	3+		1.388	1.891	
580	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	63		3	2.44	0.05	0.09		Y	Y	U	2+		0.976	2.049	
585	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	63		3	3.22	0.07	0.07	0.47	Y	Y	F	4+		1.288	2.174	14.596
587	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	68		5	4.82	0.1	0.07	1.18	Y	Y	F	4+	Gravid	1.533	2.075	24.481
591	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	70		4	3.95	0.01	0.11	0.09	Y	Y	M	4+		1.152	0.253	2.278
594	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	64		3	3.07	0.04	0.23		Y	Y	U	3+		1.171	1.303	
595	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CRH	69		4	3.7	0.08	0.26		Y	Y	F	3+	Cysts is liver	1.126	2.162	
603	Ero-Exp-5	Casino Creek	8675	455124	5435832	455042	5434634	R	0	10	70	20	0	20	0.7	9.9	8.08	118	90	5/16/2013	CHU	60		3	3.08	0.07	0.07	0.56	Y	Y	F	2+	Gravid	1.426	2.273	18.182
662	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	112		28	27.28	1.16	1.66	4.5	Y	Y	F	5+	Gravid; spot on liver - Photo 0183	1.942	4.252	16.496
663	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	100		20	18.61	0.44	3.97	3.84	Y	Y	F	4+	Gravid - full stomach	1.861	2.364	20.634
664	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	95		16	15.58	0.48	0.68	2.65	Y	Y	F	3+	Gravid	1.817	3.081	17.009
665	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	79		8	6.74	0.1	0.39	0.05	Y	Y	M	3+		1.367	1.484	0.742
666	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	86		9	8.92	0.09	0.52	0.14	Y	Y	M	3+		1.402	1.009	1.570
667	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	85		10	9.46	0.1	0.45	0.21	Y	Y	M	3+		1.540	1.057	2.220
668	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	85		10	8.93	0.09	0.4	0.16	Y	Y	M	2+		1.454	1.008	1.792
670	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	85		8	9.62	0.24	0.75	1.9	Y	Y	F	3+	Gravid; Black cysts in liver	1.566	2.495	19.751
671	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CRH	104		13	15.94	0.22	0.78	0.04	Y	Y	M	4+		1.417	1.380	0.251
672	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	65		2	4.25	0.1	0.07	0.75	Y	Y	F	2+		1.548	2.353	17.647
674	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	95		10	12.24	0.11	1.38	0.22	Y	Y	M	4+	Gravid	1.428	0.899	1.797
680	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	65		4	4	0.09	0.09	0.79	Y	Y	F	2+		1.457	2.250	19.750
684	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	74		4	6.12	0.17	0.15	1.33	Y	Y	F	4+	Gravid; Cysts in liver - Photo 0181	1.510	2.778	21.732
686	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	76		7	7.12	0.16	0.23	1.04	Y	Y	F	3+		1.622	2.247	14.607
690	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	75		4	5.06	0.05	0.21	0.1	Y	Y	M	4+		1.199	0.988	1.976
691	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	80		7	6.79	0.08	0.24	0.11	Y	Y	M	4+		1.326	1.178	1.620
692	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	70		4	4.01	0.04	0.17		Y	Y	U	3+		1.169	0.998	
693	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	80		8	7.71	0.15	0.26	0.94	Y	Y	F	4+		1.506	1.946	12.192
694	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	80		9	8.18	0.25	0.38	0.96	Y	Y	F	4+		1.598	3.056	11.736
704	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	70		4	4.08	0.03	0.17	0.08	Y	Y	M	3+		1.190	0.735	1.961

Small Body Fish Sampling

Sample No.	Area	Local Identifier	Dist_frm_CII(m)	Upstream UTM East	Upstream UTM North	Downstream UTM East	Downstream UTM North	Bank	Sub_Fines	Sub_Gravel	Sub_Cobble	Sub_Boulder	Embeddedness	D50	Ave_Velocity	Water Temp.	pH	EC	TDS	Date	Species	Total Length (mm)	Fork Length (mm)	Field Weight (g)	Lab Weight (g)	Liver Weight (g)	Gut Weight (g)	Gonad Weight (g)	Preserved	otolith Taken	Sex (m/f/u)	Age (yrs)	Comments	Condition	Liversomatic Index	Gonadosomatic Index
705	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	64		4	3.46	0.05	0.22		Y	Y	M	3+		1.320	1.445	
706	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	66		4	3.79	0.04	0.29	0.09	Y	Y	M	2+		1.318	1.055	2.375
707	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	60		2	2.53	0.02	0.08		Y	Y	U	2+		1.171	0.791	
708	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	61		2	2.57	0.02	0.11		Y	Y	U	2+		1.132	0.778	
709	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	65		4	3.99	0.14	0.12	0.89	Y	Y	F	3+	Gravid	1.453	3.509	22.306
710	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	60		2	3.22	0.03	0.12		Y	Y	U	2+		1.491	0.932	
711	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	58		3	2.58	<0.01	0.09		Y	Y	U	2+		1.322		
712	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	65		4	3.46	0.04	0.16		Y	Y	M	2+		1.260	1.156	
713	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	68		4	4.46	0.12	0.11	0.91	Y	Y	F	3+	Gravid	1.418	2.691	20.404
714	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	10	8.32	119	58	5/16/2013	CHU	60		3	2.31	0.02	0.1		Y	Y	U	2+		1.069	0.866	
719	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	9.9	8.32	119	58	5/16/2013	CRH	40		<1	0.74	<0.01	0.06		Y	Y	U	1+		1.156		
742	Ero-Ref-3	Genelle	-13700	450125	5450820	449890	5450645	R	0	10	90	0	0	25	0.7	9.9	8.32	119	58	5/16/2013	CRH	45		<1	1.05	0.02	0.11		Y	Y	U	1+		1.152	1.905	

CARO Analytical Services	Client	Ecoscape Environmental Ltd.
Analytical Testing Report	Attention	Kyle Hawes
Work Order: 3061020	Project Name	TECK- AREMP
Report Date: 7/18/2013	Project Number	Fish Tissue

Note: This is not the original data. Please refer to PDF / Hardcopy report.

General Method	Analyte	Units	RDL																			
LAB ID				3061020-01	3061020-02	3061020-03	3061020-04	3061020-05	3061020-06	3061020-07	3061020-08	3061020-09	3061020-10	3061020-11	3061020-12	3061020-13	3061020-14	3061020-15	3061020-16	3061020-17	3061020-18	3061020-19
CLIENT ID				21	22	23	24	25	26	27	28	38	39	40	43	44	45	47	49	50	55	56
DATE SAMPLED				13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13
DATE RECEIVED				18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
MATRIX				Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
General Parameters	Moisture	% wet	0.1	75.8	75.2	76	76.1	75.8	76.6	58.3	76.9	77.5	74	75	77.7	76	77.2	75.2	76.9	73.6	74.4	76.8
Strong Acid Leachable Metals	Aluminum	mg/kg wet	0.4	0.5	1.1	1.3	1.6	1.1	2.8	1	2.5	1.1	0.6	0.6	0.7	1.1	5.8	2	2.2	2.1	<0.4	0.4
Strong Acid Leachable Metals	Antimony	mg/kg wet	0.002	0.002	0.002	0.004	0.003	0.003	0.006	0.005	<0.002	0.002	0.002	<0.002	0.002	0.002	0.003	0.003	0.003	0.005	0.004	0.003
Strong Acid Leachable Metals	Arsenic	mg/kg wet	0.005	0.039	0.036	0.074	0.088	0.062	0.044	0.046	0.111	0.1	0.039	0.042	0.053	0.041	0.073	0.099	0.075	0.065	0.048	0.039
Strong Acid Leachable Metals	Barium	mg/kg wet	0.01	2.61	1.72	4.7	4.23	3.32	3.95	4.49	6.17	4.13	2.42	2.95	2.55	3.77	6.61	7.86	7.52	5.65	4.72	1.73
Strong Acid Leachable Metals	Beryllium	mg/kg wet	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strong Acid Leachable Metals	Bismuth	mg/kg wet	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Strong Acid Leachable Metals	Boron	mg/kg wet	0.1	0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2	<0.1	<0.1
Strong Acid Leachable Metals	Cadmium	mg/kg wet	0.002	0.071	0.029	0.188	0.054	0.049	0.05	0.023	0.122	0.055	0.038	0.054	0.047	0.034	0.064	0.056	0.023	0.047	0.032	0.031
Strong Acid Leachable Metals	Calcium	mg/kg wet	10	12500	7840	12600	14900	9380	9150	11900	20000	12400	10600	9420	7340	10000	16100	12300	12500	12600	12300	7020
Strong Acid Leachable Metals	Cesium	mg/kg wet	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02
Strong Acid Leachable Metals	Chromium	mg/kg wet	0.01	0.2	0.05	0.03	0.02	0.02	0.04	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.04	0.02	0.03	0.04	<0.01	0.04
Strong Acid Leachable Metals	Cobalt	mg/kg wet	0.004	0.025	0.014	0.038	0.028	0.029	0.024	0.019	0.045	0.014	0.021	0.024	0.022	0.026	0.054	0.031	0.025	0.027	0.019	0.012
Strong Acid Leachable Metals	Copper	mg/kg wet	0.01	0.59	0.43	0.75	0.64	0.77	0.42	0.49	0.68	0.54	0.56	0.62	0.42	0.59	0.75	0.61	0.64	0.66	0.54	0.34
Strong Acid Leachable Metals	Iron	mg/kg wet	1	10	12	13	12	9	13	8	13	8	9	8	6	9	20	11	8	8	7	8
Strong Acid Leachable Metals	Lead	mg/kg wet	0.004	0.242	0.111	0.295	0.335	0.192	0.235	0.255	0.409	0.271	0.168	0.127	0.101	0.192	0.322	0.222	0.297	0.289	0.143	0.086
Strong Acid Leachable Metals	Magnesium	mg/kg wet	2	358	296	396	376	315	283	389	452	389	324	296	316	303	431	360	367	350	351	251
Strong Acid Leachable Metals	Manganese	mg/kg wet	0.02	1.94	1.31	5.75	4.41	3.35	3.91	5.43	4.88	3.54	2.19	2.29	2.01	3.54	4.62	6.28	10.5	12.7	3.02	1.48
Strong Acid Leachable Metals	Mercury	mg/kg wet	0.002	0.023	0.025	0.016	0.016	0.016	0.012	0.016	0.022	0.023	0.031	0.012	0.023	0.016	0.015	0.014	0.015	0.019	0.017	0.021
Strong Acid Leachable Metals	Molybdenum	mg/kg wet	0.01	0.01	<0.01	0.03	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.01	<0.01	0.02	0.01	0.02	0.03	0.03	<0.01	<0.01
Strong Acid Leachable Metals	Nickel	mg/kg wet	0.01	0.08	0.04	0.03	0.03	0.03	0.03	0.02	0.05	0.02	0.02	0.02	0.01	0.02	0.05	0.03	0.03	0.03	0.02	0.02
Strong Acid Leachable Metals	Phosphorus	mg/kg wet	5	8200	6150	9140	9900	6790	6250	8250	11200	8730	7910	6490	5780	7100	10600	7440	7830	7530	8390	5200
Strong Acid Leachable Metals	Potassium	mg/kg wet	10	2350	2560	2500	2120	2470	1770	2060	2410	2370	2440	2000	2550	2010	2240	2100	2350	1720	2200	2080
Strong Acid Leachable Metals	Rubidium	mg/kg wet	0.01	1.96	1.81	2.01	1.83	2.34	1.42	1.46	2.79	1.99	2.03	1.59	2.55	1.4	2.68	2.49	1.61	1.42	1.66	1.54
Strong Acid Leachable Metals	Selenium	mg/kg wet	0.02	0.7	0.93	0.94	0.81	0.8	0.61	0.64	0.72	0.68	1.03	0.77	0.66	0.66	0.77	0.66	0.64	0.62	0.74	0.72
Strong Acid Leachable Metals	Silver	mg/kg wet	0.002	0.002	<0.002	0.003	0.003	0.002	0.003	0.003	0.003	<0.002	0.002	0.003	<0.002	<0.002	0.003	0.003	0.003	0.003	<0.002	<0.002
Strong Acid Leachable Metals	Sodium	mg/kg wet	2	1090	1180	1120	1040	1020	753	952	1320	994	1190	828	933	973	1110	724	814	672	1020	881
Strong Acid Leachable Metals	Strontium	mg/kg wet	0.01	21.8	14	26.3	28.9	19.5	17.5	22.7	40.5	25.7	20.4	18.1	14.3	20	33.2	27.6	26.2	26.2	23.6	13
Strong Acid Leachable Metals	Thallium	mg/kg wet	0.001	0.004	0.001	0.004	0.004	0.005	0.002	0.001	0.007	0.003	0.002	0.003	0.003	0.002	0.004	0.007	0.009	0.005	0.002	0.001
Strong Acid Leachable Metals	Tin	mg/kg wet	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Strong Acid Leachable Metals	Titanium	mg/kg wet	0.05	0.36	0.33	0.48	0.5	0.39	0.61	0.39	0.56	0.42	0.35	0.31	0.28	0.34	0.82	0.39	0.41	0.43	0.35	0.24
Strong Acid Leachable Metals	Uranium	mg/kg wet	0.001	0.01	0.009	0.014	0.013	0.01	0.008	0.01	0.016	0.009	0.011	0.006	0.005	0.006	0.018	0.011	0.013	0.011	0.005	0.008
Strong Acid Leachable Metals	Vanadium	mg/kg wet	0.02	0.04	0.06	0.1	0.15	0.1	0.09	0.12	0.14	0.07	0.05	0.09	0.06	0.08	0.18	0.13	0.25	0.17	0.06	0.06
Strong Acid Leachable Metals	Zinc	mg/kg wet	0.3	21.4	17.6	28.5	33.4	26.5	20.8	29.7	44.5	25.7	21.7	20.6	18.7	22.1	31.2	33.3	29.5	31.2	18.7	15.4
Aggregate Organic Parameters	Total Lipids	% wet	0.1	2.4	3.9	3.1	1.3	1.9	2	0.7	0.9	1	2.5	3.2	1.4	1.6	0.7	1.7	1.4	2	3.6	3.5

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units																						
		3061020-20	3061020-21	3061020-22	3061020-23	3061020-24	3061020-25	3061020-26	3061020-27	3061020-28	3061020-29	3061020-30	3061020-31	3061020-32	3061020-33	3061020-34	3061020-35	3061020-36	3061020-37	3061020-38	3061020-39	3061020-40	3061020-41
		57	58	59	60	61	62	63	64	65	66	67	68	70	72	73	74	75	77	78	79	82	83
		13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	13-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	76.5	74.8	73.7	77.9	72.8	76.6	76.2	55.9	78.9	77.6	76.1	77.3	75.3	76.2	74.5	78.9	77.1	72.8	77	71.3	75.2	72
Aluminum	mg/kg wet	0.7	0.5	1.4	0.6	0.6	0.6	0.6	1.1	0.9	2.2	1.7	1.4	0.6	2.8	1.1	2.2	1.1	0.9	3	0.5	0.5	0.7
Antimony	mg/kg wet	0.003	<0.002	0.004	<0.002	0.004	0.006	<0.002	0.005	<0.002	0.004	0.003	0.002	0.002	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.004
Arsenic	mg/kg wet	0.02	0.054	0.028	0.049	0.05	0.041	0.06	0.041	0.066	0.061	0.055	0.112	0.036	0.059	0.093	0.034	0.046	0.053	0.027	0.036	0.112	0.056
Barium	mg/kg wet	4.7	1.65	3.68	2.32	3.71	3.75	3.72	3.35	5.6	5.34	6.04	5.04	4.04	4.39	1.62	5.57	5.53	5.43	3.59	3.5	1.21	5.63
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Cadmium	mg/kg wet	0.013	0.028	0.022	0.053	0.081	0.033	0.049	0.015	0.04	0.052	0.037	0.031	0.023	0.065	0.046	0.065	0.052	0.044	0.02	0.015	0.068	0.05
Calcium	mg/kg wet	16100	5880	12300	6320	10300	8590	10600	9900	13700	10300	10600	9680	13400	16300	7920	18600	18900	16600	11000	10000	7750	15900
Cesium	mg/kg wet	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.03	0.02	0.02	0.03	0.02	0.02	0.03	0.02	0.03	0.02	0.02
Chromium	mg/kg wet	0.02	<0.01	0.02	<0.01	0.01	0.01	0.01	<0.01	<0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.02	<0.01	0.02
Cobalt	mg/kg wet	0.009	0.012	0.024	0.019	0.049	0.018	0.026	0.023	0.042	0.022	0.021	0.023	0.035	0.052	0.025	0.052	0.035	0.066	0.028	0.022	0.013	0.043
Copper	mg/kg wet	0.44	0.4	0.5	0.33	0.63	0.4	0.62	0.45	0.6	0.43	0.45	0.54	0.39	1.28	0.62	0.63	0.49	0.56	0.45	0.34	0.56	0.63
Iron	mg/kg wet	8	6	10	8	14	5	13	8	14	9	9	8	8	16	11	11	14	11	13	8	7	9
Lead	mg/kg wet	0.179	0.076	0.181	0.1	0.16	0.162	0.145	0.148	0.252	0.231	0.19	0.149	0.119	0.418	0.105	0.622	0.35	0.302	0.113	0.17	0.304	0.302
Magnesium	mg/kg wet	413	289	338	272	326	313	312	343	338	340	354	366	380	473	361	419	451	441	361	351	322	433
Manganese	mg/kg wet	2.06	2.3	2.03	2.22	3.45	3.69	2.82	2.9	4.45	4.88	8.63	4.46	4.34	3.52	1.35	3.61	3.74	6.85	5.77	4.3	1.03	8.43
Mercury	mg/kg wet	0.023	0.022	0.021	0.024	0.018	0.017	0.014	0.015	0.017	0.018	0.02	0.027	0.021	0.029	0.04	0.022	0.025	0.028	0.026	0.034	0.047	0.034
Molybdenum	mg/kg wet	<0.01	<0.01	0.01	0.01	0.02	0.01	0.01	<0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.01	0.02	0.02	0.03
Nickel	mg/kg wet	0.01	0.01	0.02	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.03	0.03	0.03	0.05	0.03	0.06	0.03	0.07	0.04	0.03	0.03	0.05
Phosphorus	mg/kg wet	10500	4880	8960	5070	8360	6210	7580	7050	8940	7000	6770	6460	9410	11400	6740	12400	12200	11700	7920	7650	6450	10600
Potassium	mg/kg wet	2230	2520	2390	2070	2570	2210	2180	2380	1890	2270	2280	2410	2540	2640	3160	2280	2130	3060	2750	2880	3040	2770
Rubidium	mg/kg wet	1.69	1.92	1.91	1.57	2.33	1.84	1.54	2.2	1.83	1.6	1.92	3.5	2.39	3.35	4.05	2.71	3.01	2.91	2.24	2.49	3.83	3.1
Selenium	mg/kg wet	0.8	0.8	0.98	0.57	1.3	0.68	0.79	0.77	0.65	0.64	0.75	0.61	0.6	0.64	0.52	0.46	0.53	0.68	0.49	0.68	0.5	0.7
Silver	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.006	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sodium	mg/kg wet	1150	845	1210	766	1150	754	999	949	1090	906	851	699	1090	1130	910	1230	1370	1440	985	930	874	1090
Strontium	mg/kg wet	32.1	12.9	23.9	12.7	19.6	18.7	21.4	20	26.7	21	23	19.5	34.1	39	13.9	44.6	44.6	42.2	27.7	26.8	13.3	34.9
Thallium	mg/kg wet	<0.001	0.002	0.001	0.002	0.002	0.002	0.002	0.002	0.005	0.003	0.003	0.006	0.005	0.014	0.01	0.01	0.003	0.004	0.002	0.003	0.005	0.005
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.48	0.23	0.57	0.24	0.37	0.28	0.34	0.33	0.38	0.43	0.34	0.31	0.43	0.59	0.35	0.64	0.58	0.52	0.47	0.33	0.29	0.49
Uranium	mg/kg wet	0.005	0.004	0.009	0.006	0.01	0.008	0.01	0.008	0.011	0.01	0.01	0.018	0.005	0.015	0.007	0.015	0.011	0.013	0.005	0.005	0.005	0.015
Vanadium	mg/kg wet	0.05	0.04	0.07	0.07	0.11	0.08	0.11	0.09	0.17	0.08	0.14	0.14	0.05	0.12	0.06	0.1	0.1	0.08	0.08	0.04	0.03	0.04
Zinc	mg/kg wet	16.9	17.7	21.8	21.8	24.4	28.3	30.3	23.8	35.9	23.7	24.9	31.4	19.5	40.4	23.9	39	40.3	28.9	19.2	21.7	22.4	36.6
Total Lipids	% wet	2.6	3.1	3.4	1.2	3.2	1.3	2.1	5.1	0.8	1.5	1.4	1.2	1.6	1.6	2.8	0.6	0.7	1.8	0.7	2.6	1.8	2

Client Ecoscape Env
Attention Kyle Hawes
Project Name TECK- AREMF
Project Number Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units	3061020-42	3061020-43	3061020-44	3061020-45	3061020-46	3061020-47	3061020-48	3061020-49	3061020-50	3061020-51	3061020-52	3061020-53	3061020-54	3061020-55	3061020-56	3061020-57	3061020-58	3061020-59	3061020-60	3061020-61	3061020-62	3061020-63
		84	86	87	89	92	97	98	99	100	101	103	104	109	110	112	117	118	131	132	133	134	136
		14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	76.8	74.7	73.4	73.5	76.7	75.4	76.7	74.5	75.1	74.9	75.1	74.7	78.2	77	70	72.4	76.2	75.4	74.6	74.2	76.1	72.5
Aluminum	mg/kg wet	0.7	<0.4	0.7	0.7	0.5	0.6	0.9	0.5	0.5	0.5	1	0.6	1.2	0.8	0.6	1	1.6	1.6	1.1	0.8	0.5	0.4
Antimony	mg/kg wet	0.003	<0.002	0.003	0.002	0.004	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	0.003	0.005	<0.002	<0.002	0.005	0.003	<0.002
Arsenic	mg/kg wet	0.051	0.041	0.067	0.037	0.124	0.067	0.04	0.063	0.028	0.036	0.154	0.068	0.053	0.041	0.038	0.071	0.099	0.075	0.069	0.102	0.031	0.038
Barium	mg/kg wet	4.87	3.46	5.23	6.12	2.61	3.74	6.35	4.66	2.63	1.24	1.04	2.21	2.88	4.96	7.72	3.24	6.67	5.29	3.52	2.26	7.06	2.31
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	0.1	<0.1	0.1	0.1	<0.1	<0.1	0.1	0.1	0.1	<0.1	<0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1
Cadmium	mg/kg wet	0.041	0.025	0.038	0.073	0.09	0.046	0.032	0.038	0.023	0.036	0.068	0.063	0.054	0.024	0.018	0.07	0.085	0.048	0.07	0.054	0.027	0.02
Calcium	mg/kg wet	15700	10800	16000	21300	15300	11500	24600	13600	9500	4540	4150	12700	16400	16200	23500	12500	17500	52100	11500	12700	25800	10600
Cesium	mg/kg wet	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.02	0.04	0.02	0.03	0.02	0.02
Chromium	mg/kg wet	0.02	0.01	0.01	0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	0.02	0.02	0.01	0.02	0.03	0.03	0.03	0.01	<0.01	0.01	0.01
Cobalt	mg/kg wet	0.035	0.031	0.038	0.038	0.017	0.048	0.044	0.032	0.024	0.025	0.028	0.044	0.056	0.037	0.026	0.035	0.048	0.029	0.03	0.045	0.02	0.024
Copper	mg/kg wet	0.58	0.46	0.59	0.64	0.49	0.49	0.62	0.62	0.44	0.38	0.39	0.54	0.73	0.61	0.36	0.45	0.54	0.67	0.48	0.56	0.48	0.47
Iron	mg/kg wet	9	8	8	8	9	8	13	8	8	5	8	10	12	11	9	9	17	9	9	9	11	9
Lead	mg/kg wet	0.295	0.101	0.132	0.695	0.862	0.551	0.184	0.088	0.068	0.049	0.124	0.412	0.421	0.065	0.22	0.114	0.394	0.44	0.461	0.301	0.153	0.051
Magnesium	mg/kg wet	377	351	442	539	431	392	557	437	342	268	284	373	410	409	456	378	427	612	356	355	543	327
Manganese	mg/kg wet	4.36	4.35	8.52	4.51	1.83	3.99	7.86	9.06	4.55	2.51	1.26	2.82	3.39	12.2	6.27	6.68	10.6	2.96	3.05	5.88	5.37	2.75
Mercury	mg/kg wet	0.024	0.026	0.022	0.027	0.039	0.028	0.021	0.024	0.029	0.029	0.047	0.033	0.024	0.02	0.042	0.028	0.021	0.056	0.036	0.036	0.037	0.034
Molybdenum	mg/kg wet	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.01	<0.01	0.02	0.02	0.05	0.05	0.03	0.04	0.02	0.02	0.02	0.02	0.04
Nickel	mg/kg wet	0.04	0.04	0.04	0.05	0.03	0.04	0.07	0.05	0.03	0.04	0.03	0.04	0.05	0.05	0.02	0.06	0.06	0.04	0.04	0.04	0.03	0.03
Phosphorus	mg/kg wet	9860	7880	11100	13300	10700	7830	15000	9490	6660	3940	3960	8060	10100	10100	14500	7610	10500	15100	7610	7900	14700	7490
Potassium	mg/kg wet	2480	2940	2740	2600	3060	2910	2730	3010	2960	2760	3060	2610	2480	2700	2740	2760	2550	2530	2540	2550	2530	2720
Rubidium	mg/kg wet	2.15	2.26	2.53	2.96	2.64	3.05	1.92	2.61	2	2.93	4.4	3.71	3.81	2.41	2.62	4	3.16	3.57	3.42	3.9	1.72	2.03
Selenium	mg/kg wet	0.54	0.82	0.59	0.68	0.49	0.58	0.6	0.56	0.58	0.54	0.65	0.64	0.54	0.58	0.75	0.54	0.61	0.53	0.56	0.62	0.7	0.84
Silver	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sodium	mg/kg wet	1090	1090	1290	1380	1090	1050	1400	1080	970	948	880	1040	1150	1040	1380	827	1050	1490	1060	918	1530	980
Strontium	mg/kg wet	31.7	22.7	32.8	47.1	22.3	23.9	52.2	32.1	20.4	9.54	5.6	24.4	34.7	32.6	49.5	31.8	48.4	56.2	23.1	26.8	62.3	24.5
Thallium	mg/kg wet	0.008	0.004	0.004	0.007	0.007	0.013	0.005	0.005	0.003	0.004	0.009	0.016	0.008	0.005	0.006	0.004	0.006	0.005	0.021	0.011	0.005	0.005
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.46	0.35	0.51	0.67	0.49	0.37	0.73	0.53	0.31	0.18	0.26	0.38	0.52	0.51	0.71	0.37	0.53	0.77	0.37	0.38	0.72	0.38
Uranium	mg/kg wet	0.008	0.006	0.01	0.024	0.015	0.011	0.022	0.007	0.003	0.004	0.005	0.014	0.018	0.009	0.011	0.026	0.015	0.015	0.014	0.013	0.009	0.006
Vanadium	mg/kg wet	0.06	0.05	0.05	0.08	0.05	0.08	0.13	0.06	0.05	<0.02	0.04	0.08	0.12	0.08	0.14	0.06	0.13	0.1	0.07	0.05	0.14	0.09
Zinc	mg/kg wet	32.5	20.3	28.5	39.7	24.2	38.1	22.1	35.6	17.7	14.8	16	43.2	40.8	20.1	33.9	31.5	38.3	49.2	36.4	42.8	24.3	18.8
Total Lipids	% wet	1	1.1	2.1	3.3	1.8	1.2	0.9	1.7	0.8	1.7	2.5	1.7	0.9	1.6	1.2	1.1	0.8	1.2	1.1	3.9	0.5	1.4

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

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Analyte Units

		3061020-64	3061020-65	3061020-66	3061020-67	3061020-68	3061020-69	3061020-70	3061020-71	3061020-72	3061020-73	3061020-74	3061020-75	3061020-76	3061020-77	3061020-78	3061020-79	3061020-80	3061020-81	3061020-82	3061020-83	3061020-84	3061020-85
		138	140	149	153	162	163	164	165	166	167	169	170	171	172	173	174	175	176	177	178	188	189
		14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	79.7	77.6	71.9	71.1	76.8	75.8	78.5	73.8	77.6	76.7	77.4	80.4	76.1	80.9	78.4	77.8	77.9	77.2	83.7	76.8	71.4	77.2
Aluminum	mg/kg wet	0.5	0.6	1.3	1.6	2.4	2.3	0.7	0.5	0.7	0.7	0.5	2.6	0.7	1.5	0.7	6.9	1.9	1	<0.4	0.7	1.3	0.5
Antimony	mg/kg wet	<0.002	0.002	0.003	0.004	0.031	0.026	0.031	0.006	0.03	0.007	0.014	0.092	0.007	0.037	0.009	0.018	0.011	0.034	0.009	0.014	0.012	0.022
Arsenic	mg/kg wet	0.052	0.044	0.106	0.094	0.209	0.152	0.172	0.047	0.119	0.063	0.12	0.589	0.072	0.34	0.093	0.256	0.141	0.158	0.096	0.135	0.11	0.131
Barium	mg/kg wet	5.32	4.94	5.11	5.14	2.92	4.74	5.2	3.01	5.65	2.88	3.6	3.55	2.19	4.09	4.91	2.56	3.98	5.33	3.3	5.48	3.8	3.63
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	mg/kg wet	0.034	0.014	0.018	0.025	0.208	0.118	0.222	0.021	0.031	0.101	0.188	0.169	0.068	0.273	0.092	0.13	0.135	0.136	0.065	0.198	0.126	0.215
Calcium	mg/kg wet	16000	15600	9880	13300	16100	15700	14600	13100	18300	4280	10900	14400	6680	16100	18200	10700	12300	16100	9090	14100	11800	10200
Cesium	mg/kg wet	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02
Chromium	mg/kg wet	0.02	0.02	0.04	0.03	0.02	0.01	0.02	0.02	<0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.04	<0.01	0.01	<0.01	0.01	0.01	<0.01
Cobalt	mg/kg wet	0.023	0.023	0.028	0.023	0.044	0.04	0.042	0.018	0.04	0.024	0.04	0.049	0.034	0.04	0.045	0.024	0.039	0.06	0.041	0.042	0.036	0.034
Copper	mg/kg wet	0.4	0.4	0.39	0.66	1.04	0.8	0.73	0.42	0.55	0.46	0.73	1.01	0.58	0.71	0.63	0.45	0.75	0.67	0.47	0.66	0.46	0.69
Iron	mg/kg wet	6	8	6	11	16	12	9	9	12	8	9	15	15	13	12	17	11	12	7	12	14	8
Lead	mg/kg wet	0.281	0.086	0.074	3.32	1.81	5.27	1.44	0.342	2.06	0.329	0.553	4.07	0.463	2.13	0.809	1.98	2.54	2.4	0.853	0.715	2.33	1.32
Magnesium	mg/kg wet	396	424	303	385	382	371	385	354	402	218	336	404	285	393	405	335	336	378	306	376	363	326
Manganese	mg/kg wet	7.33	7.12	10.1	7.55	2.62	3.81	8.77	3.08	7.18	1.78	5.71	3.34	3.14	8.12	7.26	2.77	2.81	15.9	6.83	6.79	3.98	6.58
Mercury	mg/kg wet	0.024	0.019	0.017	0.02	0.047	0.032	0.044	0.026	0.025	0.029	0.035	0.092	0.034	0.125	0.029	0.042	0.044	0.03	0.048	0.036	0.048	0.037
Molybdenum	mg/kg wet	0.02	0.03	0.02	0.03	0.03	0.03	0.02	0.02	0.05	0.01	0.01	0.03	0.03	0.04	0.06	0.02	0.02	0.04	0.03	0.03	0.06	0.02
Nickel	mg/kg wet	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.02	0.05	0.04	0.04	0.03	0.04	0.05	0.06	0.03	0.03	0.05	0.04	0.03	0.03	0.03
Phosphorus	mg/kg wet	9590	10500	6440	8430	9380	9240	9060	8200	10600	3390	6990	8990	5130	9620	10500	6820	7030	9370	5910	8630	7610	6700
Potassium	mg/kg wet	2330	2480	2190	2570	2420	2390	2560	2510	2160	2290	2550	2610	2520	2460	2370	2510	2430	2360	2460	2290	2470	2560
Rubidium	mg/kg wet	2.06	1.78	3.45	2.92	3.38	2.44	2.31	1.48	2	1.8	2.16	3.14	1.84	2.6	2.51	2.47	2.53	2.53	2.52	2.17	2.3	2.46
Selenium	mg/kg wet	0.44	0.61	0.42	0.93	0.7	0.84	0.61	0.8	0.72	0.49	0.64	0.71	0.67	0.61	0.81	0.73	0.65	0.59	0.66	1.02	0.92	0.66
Silver	mg/kg wet	<0.002	<0.002	<0.002	0.003	0.004	0.02	0.007	<0.002	0.005	0.002	0.005	0.007	<0.002	0.013	0.011	0.004	0.007	0.005	0.004	0.013	0.004	0.008
Sodium	mg/kg wet	966	1050	560	814	1130	1030	968	996	1160	912	837	937	941	951	1090	750	874	938	829	1020	1000	817
Strontium	mg/kg wet	33.3	35.3	25.5	35.3	34.1	34.2	31.4	28.7	40.9	9.31	24.9	31.2	16	34.4	39.6	23.4	25.4	35.1	21.3	31.6	29.1	22.3
Thallium	mg/kg wet	0.004	0.006	0.008	0.005	0.013	0.007	0.01	0.004	0.013	0.003	0.008	0.016	0.004	0.008	0.004	0.011	0.007	0.015	0.006	0.006	0.004	0.007
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.48	0.53	0.35	0.39	0.56	0.63	0.49	0.44	0.56	0.21	0.39	0.51	0.32	0.57	0.55	0.68	0.58	0.51	0.29	0.43	0.4	0.33
Uranium	mg/kg wet	0.009	0.013	0.008	0.011	0.01	0.015	0.007	0.007	0.012	0.005	0.005	0.011	0.005	0.014	0.011	0.019	0.012	0.014	0.008	0.011	0.016	0.007
Vanadium	mg/kg wet	0.09	0.17	0.07	0.08	0.08	0.08	0.09	0.09	0.09	0.03	0.04	0.1	0.06	0.08	0.07	0.09	0.07	0.09	0.03	0.15	0.13	0.06
Zinc	mg/kg wet	32.5	23.7	22.2	29.9	46.7	47	37.1	18	24.5	15.4	27.3	40.1	25	37.6	30.4	27.1	32	35.1	24.1	30.1	37.3	29.5
Total Lipids	% wet	0.5	2	2.5	4.3	0.9	2.5	1.2	2.3	2.2	1	1.5	1.7	1.8	0.8	1.1	2	1.6	0.8	1.4	0.7	1.6	1.5

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units	3061020-86	3061020-87	3061020-88	3061020-89	3061020-90	3061020-91	3061020-92	3061020-93	3061020-94	3061020-95	3061020-96	3061020-97	3061020-98	3061020-99	3061020-AA	3061020-AB	3061020-AC	3061020-AD	3061020-AE	3061020-AF	3061020-AG	3061020-AH
		194	197	198	200	201	202	203	204	205	206	208	209	210	211	228	229	230	232	235	241	242	244
		14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	14-May-13	15-May-13	15-May-13	15-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	74.6	76	76.1	79.2	78.5	74.6	78.2	76.6	74.9	77.9	75.8		74.2	79.6	77.4	77	75.8	76.4	77.9	77.4	78.2	87.4
Aluminum	mg/kg wet	<0.4	0.9	0.8	0.7	1.1	1.7	1.2	1	1.7	1.1	0.9	4.4	0.9	1.2	0.8	1.1	0.6	1	0.5	1.2	0.8	1.8
Antimony	mg/kg wet	0.002	0.006	0.033	0.013	0.014	0.025	0.02	0.016	0.039	0.015	0.011	0.072	0.032	0.013	0.016	0.032	0.022	0.039	0.014	0.085	0.057	0.052
Arsenic	mg/kg wet	0.034	0.113	0.327	0.201	0.098	0.494	0.218	0.157	0.49	0.092	0.11	0.453	0.267	0.101	0.086	0.168	0.065	0.347	0.144	0.245	0.14	0.131
Barium	mg/kg wet	2.13	4.72	3.42	5.6	3.73	4.31	5.8	3.97	3.79	4.47	3.58	2.96	3.26	4.82	4.06	2.55	1.71	3.56	2.27	3.15	2.8	2.12
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	mg/kg wet	0.028	0.09	0.221	0.151	0.079	0.104	0.076	0.188	0.184	0.092	0.126	0.135	0.096	0.125	0.053	0.196	0.11	0.116	0.138	0.599	0.342	0.305
Calcium	mg/kg wet	8940	13600	11500	13600	13400	10400	22000	16200	9010	17500	15700	9800	15600	18000	18200	8790	9160	18200	7690	20900	19300	9280
Cesium	mg/kg wet	0.01	0.03	0.02	0.02	0.02	0.03	0.01	0.02	0.02	0.01	0.02	0.03	0.02	0.01	0.02	0.12	0.03	0.05	0.08	0.1	0.09	0.02
Chromium	mg/kg wet	<0.01	0.01	0.01	<0.01	<0.01	0.02	0.01	0.04	0.01	0.02	0.01	0.03	0.01	0.01	0.01	0.01	<0.01	0.01	<0.01	0.01	0.02	0.02
Cobalt	mg/kg wet	0.026	0.048	0.03	0.047	0.037	0.03	0.047	0.041	0.036	0.034	0.056	0.039	0.058	0.042	0.037	0.052	0.049	0.082	0.028	0.062	0.096	0.072
Copper	mg/kg wet	0.48	0.6	0.52	0.76	0.49	0.63	0.76	0.79	0.68	0.58	0.81	0.74	0.71	0.64	0.66	0.71	0.67	0.93	0.7	1.39	1.43	1.15
Iron	mg/kg wet	9	12	11	11	8	6	12	12	9	14	10	19	11	13	10	12	9	14	7	13	17	12
Lead	mg/kg wet	0.058	0.268	1.66	1.5	1.03	1.97	0.89	0.909	4.41	0.391	1.25	2.01	2.66	0.975	1.27	2.39	0.562	9.11	1.27	11	6.89	1
Magnesium	mg/kg wet	321	373	335	353	356	420	577	503	354	513	466	296	475	457	486	358	352	448	358	467	438	348
Manganese	mg/kg wet	2.61	6.21	5.58	7.01	6.05	5.43	11.7	8.62	4.83	10.1	9.81	3.9	8.02	9.85	7.43	8.17	4.5	11.4	5.2	4.49	4.71	6.31
Mercury	mg/kg wet	0.026	0.026	0.046	0.067	0.033	0.029	0.026	0.028	0.094	0.026	0.042	0.061	0.048	0.034	0.025	0.038	0.033	0.03	0.035	0.041	0.034	0.029
Molybdenum	mg/kg wet	0.02	0.04	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.02	0.02	0.04	0.05	0.02	0.02	0.03	0.01
Nickel	mg/kg wet	0.03	0.06	0.03	0.05	0.04	0.03	0.06	0.04	0.03	0.05	0.05	0.06	0.05	0.07	0.05	0.04	0.05	0.06	0.04	0.04	0.06	0.05
Phosphorus	mg/kg wet	6290	8120	7440	8000	8250	7580	14100	11000	6340	11800	10300	6620	10400	11600	11900	6590	6920	11500	6180	12900	11800	6600
Potassium	mg/kg wet	2380	2310	2380	2250	2440	3150	2840	2850	2750	2950	2820	2330	2820	2350	2770	3020	3060	2700	3030	2520	2430	2770
Rubidium	mg/kg wet	1.68	2.6	2.56	2.63	2.89	4.57	2.31	2.34	3.13	2.17	2.84	5.03	3.37	2.09	2.46	3.01	2.68	3.04	3.13	3.32	3.14	2.39
Selenium	mg/kg wet	0.78	0.78	0.65	0.57	0.56	0.58	0.6	0.63	0.66	0.7	0.55	0.79	0.67	0.51	0.57	1.14	0.61	0.75	0.89	0.74	0.66	0.66
Silver	mg/kg wet	<0.002	0.003	0.004	0.004	<0.002	0.003	0.004	0.005	0.005	0.006	0.005	0.004	0.003	0.003	0.004	0.042	0.003	0.011	0.03	0.012	0.008	0.014
Sodium	mg/kg wet	876	877	879	911	903	811	1380	1180	982	1230	1200	776	1190	1100	1360	1080	1130	1370	976	1630	1670	1020
Strontium	mg/kg wet	19.6	31.4	25.4	30.2	29.9	20.6	41.8	33.5	24.1	33.5	30.1	24.6	30	35.2	37.9	17.9	17.5	33.7	16.2	37.1	38.8	18.6
Thallium	mg/kg wet	0.005	0.005	0.007	0.006	0.005	0.013	0.006	0.008	0.025	0.004	0.008	0.012	0.009	0.005	0.005	0.222	0.06	0.092	0.233	0.104	0.131	0.029
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.33	0.43	0.42	0.42	0.5	0.35	0.69	0.55	0.32	0.62	0.49	0.75	0.58	0.59	0.62	0.45	0.36	0.61	0.32	0.68	0.63	0.56
Uranium	mg/kg wet	0.004	0.013	0.005	0.014	0.01	0.024	0.009	0.006	0.007	0.008	0.011	0.021	0.01	0.011	0.013	0.005	0.005	0.007	0.004	0.008	0.012	0.005
Vanadium	mg/kg wet	0.06	0.14	0.06	0.07	0.07	0.1	0.13	0.07	0.11	0.09	0.09	0.09	0.07	0.07	0.05	0.09	0.03	0.09	0.03	0.08	0.12	0.04
Zinc	mg/kg wet	21.8	35.6	32.5	32.1	27.8	27.4	38.1	42.2	29.4	25.7	40.4	35.1	34.7	38.5	26.4	25.4	23	46.5	26.2	59.8	50.6	24.5
Total Lipids	% wet	1.4	2	2.1	0.7	1.2	4.5	0.7	1.2	2.8	0.7	1.1		1.5	0.8	2.3	1.4	1	1.2	1.2	0.6	0.7	0.9

Client Ecoscape Env
Attention Kyle Hawes
Project Name TECK- AREMF
Project Number Fish Tissue

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Analyte Units

		3061020-AI	3061020-AJ	3061020-AK	3061020-AL	3061020-AM	3061020-AN	3061020-AO	3061020-AP	3061020-AQ	3061020-AR	3061020-AS	3061020-AT	3061020-AU	3061020-AV	3061020-AW	3061020-AX	3061020-AY	3061020-AZ	3061020-BA	3061020-BB	3061020-BC	3061020-BD
		245	246	248	249	255	257	262	263	267	268	284	285	286	287	288	289	290	291	292	293	300	304
		15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	76.2	76.7	76	76.5	76.3	72	78.8	76.6	81.9	76	77	73.9	71	77	77.5	78.6	77.4	75.3	75.7	77.4	75.4	74
Aluminum	mg/kg wet	1.1	0.9	1	0.6	0.8	0.7	0.8	1.1	1.8	0.7	<0.4	0.7	0.9	1.8	0.8	0.7	0.7	3.3	2.3	1.3	0.6	0.5
Antimony	mg/kg wet	0.06	0.101	0.034	0.096	0.082	0.008	0.077	0.104	0.433	0.082	0.016	0.004	0.003	0.028	0.015	0.007	0.006	0.051	0.01	0.013	0.015	0.007
Arsenic	mg/kg wet	0.151	0.191	0.182	0.221	0.154	0.043	0.193	0.269	0.352	0.212	0.045	0.032	0.05	0.168	0.081	0.067	0.12	0.215	0.112	0.088	0.167	0.055
Barium	mg/kg wet	4.1	4.5	3.93	3.1	2.19	3.42	5.9	5.99	8.15	4.01	0.89	2.55	4.39	2.2	4.93	4.93	2.5	5.51	6.99	8.65	3.58	3.1
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	0.2	0.2	0.2	<0.1	<0.1
Cadmium	mg/kg wet	0.231	0.482	0.319	0.557	0.19	0.031	0.578	0.417	0.795	0.585	0.076	0.024	0.036	0.322	0.119	0.024	0.091	0.126	0.118	0.095	0.127	0.038
Calcium	mg/kg wet	23400	19300	13300	14500	10100	12300	23600	19300	25400	16000	4040	18100	16800	14400	19600	20800	11500	16100	16900	21300	12100	12200
Cesium	mg/kg wet	0.06	0.08	0.06	0.04	0.1	0.01	0.04	0.06	0.1	0.09	0.02	0.03	0.02	0.05	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02
Chromium	mg/kg wet	<0.01	0.02	0.02	0.01	<0.01	<0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02	<0.01	0.01	0.01	0.01	0.02	0.02	0.03	<0.01	0.01
Cobalt	mg/kg wet	0.112	0.078	0.054	0.053	0.062	0.026	0.051	0.034	0.047	0.078	0.026	0.016	0.03	0.056	0.036	0.035	0.044	0.067	0.042	0.038	0.032	0.026
Copper	mg/kg wet	0.99	0.84	0.82	2.08	0.73	0.37	1.79	3.27	1.41	1.31	0.44	0.42	0.63	0.76	0.52	0.53	0.75	0.74	0.9	0.92	0.76	0.41
Iron	mg/kg wet	16	10	11	11	8	12	10	9	14	10	6	7	13	10	14	8	10	15	12	14	7	8
Lead	mg/kg wet	4.2	5.18	1.75	4.78	3.84	0.6	4.15	5.59	10.8	4.48	0.169	0.91	0.498	4.57	2	0.716	1.61	3.42	0.815	0.899	3.68	0.498
Magnesium	mg/kg wet	512	517	342	438	364	375	518	435	494	465	281	449	467	424	482	543	380	347	442	436	455	389
Manganese	mg/kg wet	10.5	9.52	7.5	8.23	6.53	6.16	14.3	10	14.3	13.4	2.46	2.28	6.69	4.29	8.98	12.5	3.41	6.44	11.4	8.17	5.47	6.14
Mercury	mg/kg wet	0.027	0.034	0.034	0.034	0.031	0.028	0.03	0.025	0.044	0.034	0.035	0.043	0.023	0.03	0.021	0.017	0.022	0.019	0.026	0.027	0.04	0.022
Molybdenum	mg/kg wet	0.06	0.06	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.02	<0.01	0.04	0.03	0.03	0.03	0.02	0.03	0.04	0.04	0.03	0.02
Nickel	mg/kg wet	0.04	0.05	0.05	0.05	0.04	0.02	0.06	0.05	0.06	0.05	0.05	0.03	0.04	0.03	0.06	0.05	0.04	0.07	0.06	0.07	0.03	0.03
Phosphorus	mg/kg wet	14300	12400	8010	9660	7140	8410	13900	11600	13700	10600	3810	11900	11500	9140	11800	12900	7710	9350	10700	12000	8410	8300
Potassium	mg/kg wet	2790	2890	2650	2840	2970	2570	2470	2580	2000	2660	2960	2730	2820	2640	2570	2810	2690	1940	2520	2330	2970	2640
Rubidium	mg/kg wet	2.87	3.31	3.25	2.37	3.37	1.52	2.27	2.59	2.39	3.14	2.48	3.27	1.71	2.69	2.63	2.6	3.7	3.47	3.95	2.82	2.44	2.7
Selenium	mg/kg wet	0.78	0.77	0.65	0.6	0.67	0.72	0.5	0.61	0.52	0.71	0.51	0.92	1.22	0.81	0.75	0.54	0.68	0.6	0.73	0.57	0.75	0.6
Silver	mg/kg wet	0.007	0.005	0.016	0.01	0.007	<0.002	0.008	0.011	0.019	0.022	<0.002	<0.002	0.002	0.009	0.004	<0.002	0.003	0.005	0.005	0.005	0.008	<0.002
Sodium	mg/kg wet	1360	1160	1020	1040	997	1210	1270	1140	1290	1070	952	1420	1160	1130	1270	1230	1250	1040	1040	1240	1010	1040
Strontium	mg/kg wet	43.6	37.8	33.1	26.7	18.5	25.2	45.5	49.9	65.5	30.5	8.45	35.4	35.8	28.3	40.7	42.1	23.7	44.6	48.1	61.5	25.8	24.6
Thallium	mg/kg wet	0.106	0.209	0.061	0.046	0.129	0.006	0.021	0.023	0.072	0.231	0.004	0.002	0.004	0.03	0.002	0.005	0.004	0.006	0.006	0.004	0.013	0.004
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.72	0.58	0.36	0.49	0.41	0.45	0.66	0.49	0.59	0.54	0.21	0.59	0.64	0.56	0.55	0.64	0.46	0.62	0.48	0.53	0.44	0.43
Uranium	mg/kg wet	0.015	0.012	0.008	0.006	0.005	0.007	0.01	0.011	0.02	0.007	0.004	0.008	0.007	0.012	0.019	0.009	0.01	0.026	0.017	0.017	0.012	0.009
Vanadium	mg/kg wet	0.07	0.1	0.08	0.05	0.05	0.1	0.06	0.09	0.16	0.05	0.03	0.04	0.15	0.08	0.08	0.09	0.08	0.11	0.11	0.15	0.08	0.08
Zinc	mg/kg wet	40.3	64.2	27.8	40	27.3	23	54.3	40.1	77.1	40.9	15.7	18.6	29.4	39.4	33.2	32.7	37.3	52.2	35.2	38.7	31.3	25.3
Total Lipids	% wet	1.7	1	1.1	1.6	2.3	1.5	0.6	1	0.6	2.3	1.7	3.1	3.2	1	1.3	0.8	0.6	1.2	2.6	0.8	1.4	2.1

Client Ecoscape Env
Attention Kyle Hawes
Project Name TECK- AREMF
Project Number Fish Tissue

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Analyte Units

		3061020-BE	3061020-BF	3061020-BG	3061020-BH	3061020-BI	3061020-BJ	3061020-BK	3061020-BL	3061020-BM	3061020-BN	3061020-BO	3061020-BP	3061020-BQ	3061020-BR	3061020-BS	3061020-BT	3061020-BU	3061020-BV	3061020-BW	3061020-BX	3061020-BY	3061020-BZ
		325	327	328	329	330	331	332	333	334	335	336	337	339	340	342	343	344	346	347	348	353	356
		15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	76.5	76.6	73.9	76	76.4	73.6	75.1	75.4	76.7	75.2	78.6	74.5	76	78.8	77.7	77.1	76.2	75.1	76	75.2	78.8	77.5
Aluminum	mg/kg wet	3.1	1.7	1	1.7	0.4	<0.4	1.7	0.4	1.1	1.2	1	0.7	0.7	1.1	0.5	0.5	1.1	0.5	2	1.9	0.9	1.7
Antimony	mg/kg wet	0.019	0.056	0.01	0.046	0.006	0.008	0.065	0.01	0.009	0.017	0.019	0.017	0.03	0.025	0.024	0.012	0.017	0.019	0.037	0.019	0.021	0.035
Arsenic	mg/kg wet	0.08	0.171	0.054	0.159	0.042	0.042	0.043	0.04	0.149	0.112	0.077	0.062	0.12	0.133	0.062	0.078	0.112	0.06	0.097	0.125	0.091	0.171
Barium	mg/kg wet	4.23	2.48	4.18	4.74	1.32	1.09	15.8	1.56	3.21	3.66	2.45	3.35	3.82	6.03	5.01	4.87	4.49	4.9	5.36	5.96	4.36	5.01
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	0.2	<0.1	<0.1	0.2	<0.1	0.2
Cadmium	mg/kg wet	0.065	0.084	0.041	0.134	0.127	0.04	0.14	0.082	0.138	0.173	0.156	0.062	0.067	0.179	0.072	0.078	0.104	0.066	0.28	0.23	0.168	0.181
Calcium	mg/kg wet	13100	13800	20200	18300	4990	6000	36400	7440	18200	15800	11100	10900	15600	12300	15100	18200	12900	12100	19200	13100	16600	12200
Cesium	mg/kg wet	0.01	0.02	0.02	0.03	0.05	0.03	0.02	0.04	0.02	0.03	0.03	0.03	0.04	0.06	0.03	0.02	0.02	0.02	0.03	0.06	0.04	0.08
Chromium	mg/kg wet	0.02	0.02	0.02	0.01	<0.01	<0.01	0.04	<0.01	0.01	<0.01	0.02	0.01	<0.01	0.02	<0.01	0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01
Cobalt	mg/kg wet	0.032	0.06	0.03	0.048	0.033	0.019	0.041	0.033	0.068	0.041	0.063	0.049	0.073	0.051	0.047	0.041	0.031	0.029	0.071	0.053	0.048	0.054
Copper	mg/kg wet	1.19	1.18	0.91	0.94	0.61	0.4	0.71	0.48	1.17	0.75	0.82	0.48	1.13	0.71	0.79	0.64	0.49	0.69	1.19	0.9	0.79	0.78
Iron	mg/kg wet	12	14	8	16	7	6	20	8	11	9	12	6	8	9	11	11	10	7	13	19	10	15
Lead	mg/kg wet	1.69	1.65	1.84	2.9	0.528	0.178	4.08	0.277	1.77	1.94	0.591	1.28	1.26	1.07	0.445	1.02	0.936	0.864	2.5	1.08	0.928	1.43
Magnesium	mg/kg wet	376	409	426	459	310	299	760	338	473	464	351	408	408	347	413	470	353	387	440	351	444	343
Manganese	mg/kg wet	4.7	3.98	3.82	5.58	1.82	2.18	16.1	3.23	3.9	6.73	5.65	6.33	4.1	10.6	9.18	7.93	6.24	6.91	5.13	8.82	10.7	8.74
Mercury	mg/kg wet	0.032	0.026	0.019	0.02	0.04	0.023	0.043	0.025	0.02	0.023	0.018	0.024	0.022	0.021	0.016	0.021	0.018	0.025	0.025	0.025	0.027	0.023
Molybdenum	mg/kg wet	0.02	0.02	0.02	0.03	0.01	0.02	0.07	0.03	0.03	0.03	0.02	0.01	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.03	0.04
Nickel	mg/kg wet	0.05	0.05	0.04	0.05	0.03	0.02	0.05	0.03	0.05	0.03	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.05	0.04	0.04	0.04
Phosphorus	mg/kg wet	8150	9150	12500	11900	4750	5190	18900	6210	11200	10500	7550	8090	9970	7950	9700	11400	8080	8210	11900	8470	10600	7960
Potassium	mg/kg wet	2480	2900	2480	2600	3060	3170	2520	3000	2570	2790	2510	3220	2670	2530	2500	2620	2730	2750	2220	2600	2600	2620
Rubidium	mg/kg wet	2.34	2.71	2.99	3.43	3.65	2.24	2.12	2.75	3.36	2.87	2.76	3.39	4.15	3.81	2.73	3	1.97	2.11	2.74	3.93	2.99	4.16
Selenium	mg/kg wet	0.54	0.7	0.61	0.92	0.71	0.61	0.66	0.78	0.69	0.92	0.58	0.51	0.67	0.7	0.63	0.6	0.49	0.55	0.6	0.83	0.57	1.01
Silver	mg/kg wet	0.006	0.004	0.006	0.003	0.002	<0.002	0.006	0.002	0.004	<0.002	0.004	0.002	0.002	0.002	<0.002	0.003	0.003	0.003	0.007	0.004	0.004	0.004
Sodium	mg/kg wet	1070	1190	1510	1290	1000	820	1880	1050	1360	1000	1030	979	1180	878	1080	1230	838	1050	1170	944	1030	859
Strontium	mg/kg wet	25.8	27.6	40.6	38.7	9.95	11.5	94.9	15.6	40.8	33.6	22.6	26.1	32	35.5	31.7	41.2	40.2	27.4	42.8	38	34.4	36.5
Thallium	mg/kg wet	0.011	0.021	0.003	0.031	0.025	0.016	0.016	0.027	0.004	0.055	0.006	0.009	0.064	0.064	0.032	0.006	0.005	0.005	0.033	0.058	0.033	0.064
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.58	0.58	0.71	0.68	0.26	0.29	1.31	0.35	0.69	0.64	0.48	0.5	0.49	0.36	0.55	0.54	0.36	0.45	0.65	0.44	0.63	0.41
Uranium	mg/kg wet	0.013	0.022	0.015	0.029	0.002	0.002	0.046	0.004	0.014	0.016	0.007	0.009	0.017	0.016	0.007	0.01	0.008	0.012	0.015	0.014	0.01	0.016
Vanadium	mg/kg wet	0.1	0.14	0.08	0.12	0.03	0.04	0.34	0.05	0.07	0.13	0.09	0.06	0.13	0.12	0.07	0.06	0.06	0.06	0.21	0.15	0.12	0.12
Zinc	mg/kg wet	34.7	46.3	34.6	64.1	32	14.8	33.8	17.1	37.3	42.4	33.1	39.6	31.5	37.3	29.8	33.8	33.6	27.4	45.2	41.3	36.8	51.5
Total Lipids	% wet	1.3	1.1	3.4	3	1	1.9	0.7	2.3	0.7	3.5	1.1	1.5	3.8	1.8	2	0.9	2.2	1.6	2	4.1	0.9	1.5

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

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Analyte	Units																						
		3061020-CA	3061020-CB	3061020-CC	3061020-CD	3061020-CE	3061020-CF	3061020-CG	3061020-CH	3061020-CI	3061020-CJ	3061020-CK	3061020-CL	3061020-CM	3061020-CN	3061020-CO	3061020-CP	3061020-CQ	3061020-CR	3061020-CS	3061020-CT	3061020-CU	3061020-CV
		357	358	363	375	376	377	379	389	399	440	441	442	443	446	447	451	456	458	470	471	478	479
		15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	15-May-13	16-May-13	16-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	78.7	76.8	77.1	77.6	76.6	78.5	74.1	78.4	77.2	78.2	76.1	75.2	76.3	78.5	77.1	77.4	77.4	78	81.1	76.7	75.8	75.1
Aluminum	mg/kg wet	1.4	2	2.2	0.7	0.6	1.4	1.4	1.1	1	1.4	4.8	1.4	1.8	1.4	0.9	2.6	1.4	1.5	5	1.5	0.7	0.9
Antimony	mg/kg wet	0.023	0.029	0.032	0.01	0.01	0.025	0.068	0.035	0.03	0.011	0.011	0.013	0.015	0.012	0.007	0.015	0.009	0.01	0.043	0.039	0.008	0.005
Arsenic	mg/kg wet	0.165	0.122	0.236	0.039	0.021	0.054	0.072	0.046	0.075	0.04	0.032	0.021	0.04	0.043	0.02	0.056	0.047	0.048	0.088	0.128	0.017	0.017
Barium	mg/kg wet	5.79	4.71	4.94	3.06	1.65	2.64	5.4	3.92	3.93	2.37	2.11	2.67	3.42	5.37	2.24	1.98	2.63	2	4.8	5.51	1.8	2.06
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	0.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1
Cadmium	mg/kg wet	0.305	0.269	0.106	0.062	0.026	0.086	0.098	0.066	0.111	0.054	0.023	0.043	0.064	0.052	0.032	0.072	0.073	0.073	0.099	0.076	0.023	0.025
Calcium	mg/kg wet	12800	11900	15200	8970	10100	9860	20700	16200	16100	10500	12200	15400	11100	19300	14200	6850	8690	7650	11000	14300	14300	14800
Cesium	mg/kg wet	0.08	0.07	0.03	0.01	0.04	0.03	0.03	0.03	0.02	0.02	0.05	0.05	0.02	0.02	0.04	0.02	0.03	0.02	0.04	0.02	0.04	0.04
Chromium	mg/kg wet	0.02	0.03	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.03	0.01	0.01	0.1	0.02	0.02	0.02	0.02	0.01	0.02
Cobalt	mg/kg wet	0.059	0.075	0.071	0.033	0.016	0.039	0.053	0.047	0.066	0.018	0.015	0.024	0.027	0.046	0.019	0.032	0.027	0.04	0.058	0.027	0.011	0.012
Copper	mg/kg wet	0.96	0.95	1.75	0.51	0.54	0.79	0.52	0.57	0.65	0.47	0.48	0.53	0.64	0.75	0.53	0.62	0.68	1.05	0.85	0.69	0.51	0.43
Iron	mg/kg wet	10	15	14	9	8	13	14	15	14	7	13	10	10	9	8	14	10	14	18	10	10	9
Lead	mg/kg wet	1.5	1.19	1.62	0.276	0.446	0.478	1.4	0.666	0.894	1.08	0.383	0.38	0.906	1.9	0.587	0.591	0.522	0.389	0.759	0.95	0.338	0.448
Magnesium	mg/kg wet	348	303	380	313	309	312	482	400	376	310	352	379	339	406	379	254	311	309	310	377	398	379
Manganese	mg/kg wet	10.3	7.61	9.96	6.43	1.39	5.51	6.6	6.68	5.74	1.45	1.52	2.35	3.49	4.03	1.8	1.84	2.82	2.09	6.96	7.06	1.42	1.54
Mercury	mg/kg wet	0.022	0.021	0.016	0.013	0.031	0.016	0.047	0.022	0.013	0.03	0.044	0.047	0.024	0.017	0.036	0.026	0.024	0.028	0.017	0.018	0.041	0.045
Molybdenum	mg/kg wet	0.04	0.04	0.06	0.02	<0.01	0.02	0.06	0.04	0.05	0.02	<0.01	0.02	0.02	0.03	<0.01	0.03	0.02	0.02	0.03	0.03	<0.01	0.01
Nickel	mg/kg wet	0.06	0.05	0.06	0.02	0.02	0.04	0.05	0.05	0.05	0.03	0.03	0.02	0.03	0.04	0.02	0.07	0.03	0.03	0.05	0.06	0.02	0.02
Phosphorus	mg/kg wet	8600	7350	9400	6160	6560	6240	12400	9530	9730	6470	7540	9640	6860	10900	8490	4530	5890	5560	7050	7920	8960	8850
Potassium	mg/kg wet	2500	2680	2390	2490	2460	2330	2540	2550	2550	2310	2730	2590	2470	2290	2650	2280	2790	2810	2130	2260	2940	2590
Rubidium	mg/kg wet	4.75	4.55	4.84	1.46	2.65	2.63	2.58	2.77	2.48	2.5	2.91	3.14	2.51	2.72	2.84	2.4	3.54	2.78	3.95	1.86	3.3	2.74
Selenium	mg/kg wet	0.85	0.79	0.89	0.69	0.57	0.49	0.85	0.5	0.77	0.49	0.53	0.7	0.46	0.5	0.52	0.45	0.59	0.57	0.78	0.58	0.54	0.51
Silver	mg/kg wet	0.004	0.004	0.041	<0.002	<0.002	0.004	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	0.02	<0.002	<0.002	0.003	<0.002	0.003	0.003	0.002	<0.002	<0.002
Sodium	mg/kg wet	767	883	870	815	991	896	1430	1130	1180	1040	1090	1370	1080	1360	1100	962	873	914	659	618	1110	1080
Strontium	mg/kg wet	35.5	32.6	41.2	18.8	19.6	20.2	44	33.7	35.9	21.9	23.7	29.2	23	40.1	28.2	14.9	18.3	16.9	30.7	40.9	27.3	31.8
Thallium	mg/kg wet	0.096	0.07	0.013	0.011	0.009	0.011	0.015	0.012	0.006	0.011	0.007	0.012	0.016	0.009	0.01	0.012	0.019	0.022	0.052	0.021	0.011	0.009
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.38	0.39	0.5	0.24	0.25	0.29	0.46	0.36	0.36	0.31	0.61	0.44	0.39	0.45	0.34	0.35	0.35	0.31	1.2	0.96	0.35	0.35
Uranium	mg/kg wet	0.015	0.015	0.018	0.004	0.004	0.006	0.024	0.009	0.007	0.006	0.005	0.005	0.009	0.012	0.005	0.004	0.007	0.004	0.008	0.015	0.004	0.003
Vanadium	mg/kg wet	0.14	0.13	0.13	0.05	0.03	0.08	0.17	0.08	0.06	0.04	0.04	0.03	0.05	0.09	0.03	0.06	0.07	0.06	0.08	0.1	0.03	0.03
Zinc	mg/kg wet	44.6	50.7	40.3	24.2	23.4	26.3	50.5	33.1	39.2	23.7	25.6	25.9	30.1	34.9	26.3	19.8	25.3	22.6	34.5	32.8	19.2	22
Total Lipids	% wet	2.6	2.4	2.5	2.3	2.1	0.7	1	0.8	1.5	1.1	2.3	1.9	1.7	1.1	1.7	1.7	1.3	1.5	2.8	2.6	3.2	2.8

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units	3061020-CW	3061020-CX	3061020-CY	3061020-CZ	3061020-DA	3061020-DB	3061020-DC	3061020-DD	3061020-DE	3061020-DF	3061020-DG	3061020-DH	3061020-DI	3061020-DJ	3061020-DK	3061020-DL	3061020-DM	3061020-DN	3061020-DO	3061020-DP	3061020-DQ
		480	481	482	483	484	492	497	504	510	530	532	533	534	535	537	539	541	543	544	548	552
		16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	75.1	73.9	75	76	77.6	76.1	76.8	75.8	75.4	76.6	77.2	75.1	73.9	76.8	77.4	75.1	76.3	78.4	75.1	80.7	74.2
Aluminum	mg/kg wet	0.8	0.7	0.8	0.9	1.5	2.5	2.4	1.5	2.9	2.4	1.2	1.8	0.8	0.9	1.1	1.2	1.1	1.8	1.1	0.8	0.9
Antimony	mg/kg wet	0.016	0.005	0.009	0.015	0.013	0.026	0.029	0.057	0.099	0.082	0.019	0.008	0.019	0.005	0.026	0.035	0.006	0.01	0.042	0.009	0.014
Arsenic	mg/kg wet	0.044	0.025	0.019	0.032	0.034	0.116	0.097	0.084	0.213	0.067	0.027	0.035	0.031	0.027	0.069	0.056	0.033	0.032	0.055	0.031	0.04
Barium	mg/kg wet	0.92	0.95	1.89	3.29	2.49	2.45	7.69	2.15	5.89	4.37	1.93	1.46	2.28	2.5	1.91	2.75	1.74	2.91	4.14	2.37	2.5
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	mg/kg wet	0.092	0.052	0.037	0.022	0.044	0.063	0.098	0.085	0.104	0.053	0.033	0.02	0.05	0.024	0.091	0.107	0.025	0.023	0.071	0.059	0.104
Calcium	mg/kg wet	3690	5800	15100	24200	18500	15300	21400	12600	11700	18500	14100	10600	9370	16100	9220	12300	11400	13200	15500	14000	8170
Cesium	mg/kg wet	0.04	0.06	0.04	0.04	0.05	0.03	0.03	0.03	0.03	0.02	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04	0.02
Chromium	mg/kg wet	0.01	0.01	0.02	0.01	0.02	0.04	0.02	0.02	0.04	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.02	0.02
Cobalt	mg/kg wet	0.051	0.023	0.015	0.014	0.02	0.045	0.095	0.047	0.041	0.049	0.021	0.017	0.045	0.014	0.052	0.062	0.014	0.015	0.035	0.034	0.027
Copper	mg/kg wet	0.5	0.5	0.5	0.45	0.5	0.98	1.14	0.87	0.67	0.59	0.48	0.54	0.47	0.42	0.61	0.62	0.53	0.55	0.52	0.49	0.39
Iron	mg/kg wet	14	8	20	9	13	22	17	11	15	21	9	11	11	14	8	15	10	13	10	8	13
Lead	mg/kg wet	0.267	0.178	0.392	0.466	0.405	0.81	1.86	1.13	1.1	0.633	0.579	0.28	0.324	0.41	0.668	0.349	0.436	0.372	0.697	0.57	0.242
Magnesium	mg/kg wet	211	239	396	464	412	358	430	366	325	435	337	334	266	355	320	339	304	349	414	357	283
Manganese	mg/kg wet	1.48	0.81	1.02	1.3	2.49	2.82	8.34	3.89	6.41	3.99	1.99	1.29	3.36	0.98	2.72	6.02	0.89	1.59	5.02	1.41	2.96
Mercury	mg/kg wet	0.031	0.046	0.086	0.039	0.047	0.026	0.016	0.031	0.015	0.025	0.03	0.044	0.031	0.035	0.024	0.02	0.043	0.025	0.034	0.033	0.039
Molybdenum	mg/kg wet	0.02	0.01	0.01	0.02	0.01	0.03	0.05	0.04	0.03	0.05	<0.01	<0.01	0.04	<0.01	0.02	0.04	<0.01	0.01	0.04	0.01	0.02
Nickel	mg/kg wet	0.04	0.02	0.02	0.02	0.02	0.04	0.06	0.04	0.04	0.07	0.02	0.02	0.07	0.02	0.03	0.07	0.02	0.02	0.03	0.02	0.03
Phosphorus	mg/kg wet	3490	4540	8850	13900	10400	8900	12100	7550	6740	10400	7940	6730	6260	9000	5930	7480	6790	7680	8890	8100	5380
Potassium	mg/kg wet	2670	2720	2560	2780	2200	2540	2450	2390	1860	2220	2450	2520	2750	2340	2790	2500	2390	2410	2630	2480	2610
Rubidium	mg/kg wet	3.18	3.47	2.64	2.9	2.68	3.59	2.99	3.05	2.77	1.34	3.12	2.79	3.06	2.49	3.63	3.34	2.48	2.53	2.53	2.96	1.78
Selenium	mg/kg wet	0.66	0.83	0.58	0.59	0.52	0.7	0.68	0.7	0.58	0.7	0.57	0.59	0.77	0.57	0.64	0.84	0.61	0.51	0.61	0.57	0.69
Silver	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002
Sodium	mg/kg wet	999	1120	1180	1310	1410	1210	1380	912	612	1360	1130	911	948	1220	925	922	1210	998	1030	1010	1030
Strontium	mg/kg wet	7.79	11.5	32.3	48.7	37.3	29.7	47.3	26.6	34.2	44.7	28.2	20.8	21.1	32.5	19.2	27.3	23.3	26.3	32.8	31.6	17.8
Thallium	mg/kg wet	0.01	0.007	0.007	0.01	0.009	0.048	0.032	0.038	0.03	0.015	0.008	0.008	0.012	0.009	0.019	0.015	0.007	0.016	0.022	0.01	0.012
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.17	0.2	0.36	0.54	0.5	0.45	0.59	0.34	0.86	0.48	0.35	0.35	0.25	0.36	0.25	0.31	0.29	0.36	0.36	0.33	0.23
Uranium	mg/kg wet	0.004	0.002	0.004	0.005	0.005	0.017	0.014	0.014	0.009	0.038	0.01	0.004	0.007	0.003	0.013	0.011	0.006	0.006	0.011	0.008	0.005
Vanadium	mg/kg wet	0.04	0.03	0.06	0.07	0.06	0.13	0.1	0.07	0.07	0.22	0.05	0.06	0.06	0.05	0.07	0.07	0.05	0.06	0.13	0.06	0.08
Zinc	mg/kg wet	19.1	20.5	22.2	24.4	29.3	37.5	50.2	52.7	28.7	60.2	25.1	20.7	25.5	24.1	36.6	30.3	24.5	23.2	42	23.5	24.5
Total Lipids	% wet	2.4	2.7	1.9	3	1.3	2.7	1.4	2.3	2.8	1.8	2.2	3	1.2	2.7	1.5	1.8	3.3	1.5	0.8	0.8	0.8

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units	3061020-DR	3061020-DS	3061020-DT	3061020-DU	3061020-DV	3061020-DW	3061020-DX	3061020-DY	3061020-DZ	3061020-EA	3061020-EB	3061020-EC	3061020-ED	3061020-EE	3061020-EF	3061020-EG	3061020-EH	3061020-EI	3061020-EJ	3061020-EK	3061020-EL	3061020-EM
		563	569	570	572	573	576	580	585	587	591	594	595	603	662	663	664	665	666	667	668	670	671
		16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	80.7	76.9	78.6	77.4	74	74.8	75.9	71.6	73.3	78.3	78.6	77.6	71.7	74.6	82.3	71.8	74.5	76.7	75.6	76.2	75.2	78.2
Aluminum	mg/kg wet	1	0.9	1.8	4.3	1.6	1	1.2	1.8	1.2	1.6	0.7	2.2	0.5	1.2	0.9	1.4	1	1.5	1.4	1.1	1.6	0.8
Antimony	mg/kg wet	0.021	0.029	0.06	0.073	0.024	0.041	0.03	0.024	0.034	0.055	0.039	0.021	0.015	0.002	0.004	0.003	<0.002	0.002	0.002	<0.002	0.002	<0.002
Arsenic	mg/kg wet	0.057	0.061	0.068	0.138	0.092	0.069	0.116	0.066	0.046	0.066	0.043	0.061	0.052	0.023	0.033	0.042	0.056	0.037	0.025	0.041	0.112	0.031
Barium	mg/kg wet	2.91	5.44	4.39	4.61	1.71	10.2	1.55	8.58	3.33	16.7	1.95	4.26	4.02	2.1	4.69	1.95	4.21	1.89	4.25	2.49	4	2.83
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	mg/kg wet	0.107	0.077	0.077	0.198	0.069	0.062	0.052	0.058	0.036	0.061	0.025	0.092	0.042	0.008	0.052	0.05	0.038	0.043	0.025	0.027	0.047	0.076
Calcium	mg/kg wet	12100	18700	21700	18000	6990	29000	8030	31100	17600	35200	152	11400	13900	10100	14600	8320	12100	6520	16300	9360	20400	12600
Cesium	mg/kg wet	0.03	0.02	0.04	0.03	0.04	0.02	0.04	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.03
Chromium	mg/kg wet	0.01	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	<0.01	0.04	0.02	0.01	0.01	0.01	0.04	0.03	0.02	0.01	0.02	0.02
Cobalt	mg/kg wet	0.038	0.039	0.083	0.091	0.044	0.043	0.036	0.039	0.044	0.035	0.03	0.052	0.027	0.011	0.03	0.018	0.03	0.042	0.029	0.025	0.04	0.022
Copper	mg/kg wet	0.57	0.52	0.74	1.06	0.68	0.36	0.67	0.48	0.47	0.44	0.35	0.81	0.41	0.35	0.6	0.45	0.5	0.45	0.52	0.46	0.57	0.48
Iron	mg/kg wet	13	11	21	29	11	11	9	19	13	15	7	19	8	7	15	8	9	11	11	8	19	9
Lead	mg/kg wet	0.545	0.397	0.554	1.26	0.398	1.4	0.263	0.93	0.367	1.2	0.008	0.433	0.256	0.079	0.167	0.269	0.171	0.149	0.084	0.082	0.355	0.106
Magnesium	mg/kg wet	322	478	438	368	284	597	345	597	444	669	159	345	380	273	369	263	395	276	437	317	434	366
Manganese	mg/kg wet	4.01	5.76	7.61	6.03	2.62	9.81	2.46	10	4.29	14.1	2.6	5.94	5.8	1.49	3.34	1.49	4.25	2.81	5.81	3.96	2.66	2.52
Mercury	mg/kg wet	0.022	0.026	0.012	0.019	0.017	0.029	0.02	0.026	0.023	0.027	<0.002	0.023	0.024	0.033	0.027	0.032	0.03	0.036	0.029	0.026	0.019	0.041
Molybdenum	mg/kg wet	0.03	0.02	0.07	0.07	0.02	0.06	0.01	0.04	0.06	0.03	0.02	0.02	0.02	<0.01	0.02	0.01	0.02	0.02	0.03	0.02	0.02	0.02
Nickel	mg/kg wet	0.05	0.03	0.07	0.06	0.03	0.04	0.03	0.04	0.03	0.04	0.03	0.02	0.03	0.02	0.04	0.03	0.04	0.09	0.05	0.03	0.04	0.03
Phosphorus	mg/kg wet	7050	11100	12100	9800	4960	15800	5600	16600	11000	19200	3880	6880	8640	6310	9010	5600	8050	4840	9990	6430	11900	12800
Potassium	mg/kg wet	2410	2590	2380	2260	2690	2560	2980	2520	2670	2260	1110	2620	2670	2430	2480	2640	2850	2540	2650	2830	2420	2710
Rubidium	mg/kg wet	3.01	1.75	3.07	3.18	3.42	2.13	4.66	1.74	1.36	1.71	1.51	3.34	1.93	2.89	2.94	3.62	3.08	2.36	2.26	2.56	2.43	3.19
Selenium	mg/kg wet	0.63	0.75	0.62	0.6	0.69	0.74	0.48	0.95	0.81	0.67	0.25	0.61	0.84	0.69	0.63	0.87	0.59	0.54	0.64	0.57	0.62	0.54
Silver	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.011	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Sodium	mg/kg wet	927	1240	1140	1110	815	1330	754	1430	1380	1590	476	875	910	1060	1130	980	1060	985	1210	1160	1520	1140
Strontium	mg/kg wet	24.7	43.7	45.8	37.1	14	66.7	12.6	70.2	38	86.7	14	24.6	31.4	21	33.7	17.4	27	14.6	37.5	20.9	46.5	26.6
Thallium	mg/kg wet	0.016	0.012	0.014	0.04	0.031	0.015	0.038	0.016	0.013	0.014	<0.001	0.016	0.018	0.003	0.004	0.003	0.005	0.004	0.004	0.003	0.006	0.004
Tin	mg/kg wet	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.29	0.46	0.49	0.48	0.24	0.62	0.26	0.73	0.48	0.88	0.16	0.39	0.33	1.06	0.39	0.28	0.35	0.23	0.4	0.26	0.51	0.33
Uranium	mg/kg wet	0.007	0.009	0.027	0.017	0.008	0.022	0.007	0.021	0.01	0.021	<0.001	0.013	0.007	0.004	0.01	0.009	0.009	0.011	0.008	0.005	0.012	0.008
Vanadium	mg/kg wet	0.05	0.15	0.14	0.12	0.07	0.19	0.08	0.23	0.14	0.29	0.07	0.08	0.11	0.04	0.07	0.05	0.05	0.05	0.06	0.04	0.19	0.04
Zinc	mg/kg wet	25.9	30.3	41.9	71.4	38.4	55.7	24	33.8	28.1	43.4	22.7	47.8	28.8	16.4	26.4	19.8	26.7	20.3	20.7	19.4	28	22
Total Lipids	% wet	1.4	0.6	1.8	1.4	4.7	1.5	3.9	1.3	1.5	0.7	1.3	2.4	2	4.1	2.1	2.6	1.9	1.3	1.6	2	1.1	1

Client	Ecoscape Env
Attention	Kyle Hawes
Project Name	TECK- AREMF
Project Number	Fish Tissue

Please refer to PDF / Hardcopy r

Analyte Units

		3061020-EN	3061020-EO	3061020-EP	3061020-EQ	3061020-ER	3061020-ES	3061020-ET	3061020-EU	3061020-EV	3061020-EW	3061020-EX	3061020-EY	3061020-EZ	3061020-FA	3061020-FB	3061020-FC	3061020-FD	3061020-FE	3061020-FF	3061020-FG	3061020-FH	3061020-FI
		672	674	680	684	686	690	691	692	693	694	704	705	706	707	708	709	710	711	712	713	714	719
		16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13	16-May-13
		18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13	18-Jun-13
		Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue	Tissue
Moisture	% wet	74	76	74.7	73.2	74.5	75.7	77.7	75.8	76	76	78.2	78.7	75.8	73.2	75.2	74.4	76.7	76.1	74.3	73.1	77.3	77
Aluminum	mg/kg wet	0.7	1.1	0.9	0.8	0.7	1.5	0.7	0.8	0.7	0.8	0.7	1	0.8	0.5	0.7	0.7	0.5	0.5	0.7	0.8	0.8	0.9
Antimony	mg/kg wet	<0.002	<0.002	0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.005
Arsenic	mg/kg wet	0.045	0.046	0.049	0.04	0.035	0.069	0.056	0.059	0.051	0.05	0.044	0.046	0.043	0.055	0.088	0.052	0.052	0.058	0.068	0.058	0.065	0.072
Barium	mg/kg wet	2.64	3.56	7.86	3	1.68	9.41	2.89	2.06	1.39	5.68	4.1	6.1	6.24	2.34	6.31	8.85	3.09	6.51	2.86	8.08	7.66	5.08
Beryllium	mg/kg wet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	mg/kg wet	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Cadmium	mg/kg wet	0.021	0.031	0.015	0.025	0.018	0.031	0.031	0.017	0.047	0.03	0.015	0.017	0.017	0.025	0.015	0.013	0.026	0.042	0.031	0.013	0.033	0.098
Calcium	mg/kg wet	7800	10600	20800	10900	5060	28000	11000	8260	4110	15100	8340	17300	13800	4740	10000	23500	10900	15000	10400	20400	16700	10200
Cesium	mg/kg wet	0.02	0.02	0.01	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Chromium	mg/kg wet	0.03	0.02	0.02	0.01	0.01	0.03	0.02	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.02	0.01	0.01	<0.01	0.01	0.01	0.02	0.01
Cobalt	mg/kg wet	0.022	0.037	0.026	0.024	0.04	0.042	0.032	0.028	0.049	0.034	0.024	0.03	0.029	0.024	0.021	0.031	0.028	0.035	0.038	0.026	0.045	0.045
Copper	mg/kg wet	0.44	0.59	0.44	0.44	0.42	0.69	0.47	0.52	0.54	0.54	0.41	0.49	0.45	0.47	0.39	0.4	0.48	0.56	0.52	0.39	0.53	0.54
Iron	mg/kg wet	10	13	10	9	7	13	12	6	8	9	6	9	11	8	6	10	9	8	8	9	11	9
Lead	mg/kg wet	0.047	0.093	0.141	0.104	0.042	0.174	0.08	0.074	0.05	0.146	0.048	0.082	0.057	0.025	0.091	0.136	0.09	0.065	0.055	0.143	0.09	0.125
Magnesium	mg/kg wet	314	345	485	355	248	631	322	343	234	411	340	448	426	267	347	522	345	406	345	467	439	314
Manganese	mg/kg wet	3.26	5.37	8.83	2.59	3.38	9.68	4.68	1.48	3.06	8.07	6.71	9.54	8.63	3.11	8.65	7.79	6.46	12.3	7.69	9.49	9.19	6.66
Mercury	mg/kg wet	0.028	0.029	0.02	0.038	0.027	0.035	0.016	0.026	0.026	0.037	0.017	0.018	0.024	0.023	0.024	0.023	0.015	0.019	0.022	0.027	0.02	0.018
Molybdenum	mg/kg wet	0.02	0.02	0.06	0.04	0.02	0.04	0.02	0.01	0.03	0.03	0.02	0.05	0.03	0.01	0.02	0.06	0.02	0.03	0.03	0.05	0.04	0.03
Nickel	mg/kg wet	0.03	0.06	0.04	0.03	0.05	0.05	0.03	0.03	0.08	0.05	0.03	0.04	0.05	0.03	0.03	0.03	0.03	0.04	0.05	0.04	0.06	0.05
Phosphorus	mg/kg wet	5500	6930	12500	7450	4260	16300	7210	5900	4070	9740	6010	10600	8880	4020	6890	14400	7240	9410	6860	12300	10400	6760
Potassium	mg/kg wet	2630	2620	2940	2890	2930	2540	2760	3100	2750	2880	2890	2880	2920	3170	3010	2920	2800	2890	2870	2890	2930	2110
Rubidium	mg/kg wet	2.48	2.56	2.13	2.98	3.26	2.16	3.17	4.02	3.04	2.89	3.15	2.83	2.94	3.31	2.92	2.9	3.19	2.76	2.74	2.37	2.88	3.12
Selenium	mg/kg wet	0.93	0.57	0.74	0.83	0.56	0.74	0.79	0.39	0.79	0.65	0.52	0.61	0.58	0.76	0.56	0.77	0.6	0.61	0.54	0.77	0.6	0.58
Silver	mg/kg wet	<0.002	0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Sodium	mg/kg wet	915	997	1340	1050	861	1280	1160	741	875	1290	808	1100	854	791	785	1350	798	899	780	1330	1050	769
Strontium	mg/kg wet	16.9	26.4	48.7	24.2	10.6	75.5	24.8	14.4	9.52	35.8	20.7	39.2	32.5	14.1	28.8	58.9	25.6	38	24.4	49.9	45.1	30.3
Thallium	mg/kg wet	0.006	0.003	0.005	0.005	0.003	0.005	0.003	0.007	0.004	0.005	0.006	0.004	0.004	0.004	0.007	0.006	0.004	0.005	0.005	0.006	0.004	0.01
Tin	mg/kg wet	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	mg/kg wet	0.22	0.29	0.51	0.31	0.2	0.74	0.31	0.24	0.18	0.39	0.25	0.43	0.36	0.21	0.31	0.55	0.27	0.35	0.32	0.56	0.39	0.3
Uranium	mg/kg wet	0.004	0.007	0.013	0.016	0.004	0.02	0.005	0.008	0.005	0.007	0.004	0.008	0.008	0.002	0.008	0.012	0.005	0.006	0.006	0.011	0.01	0.01
Vanadium	mg/kg wet	0.07	0.06	0.15	0.11	0.04	0.22	0.05	0.04	0.04	0.06	0.04	0.08	0.06	0.07	0.14	0.2	0.06	0.07	0.06	0.2	0.11	0.13
Zinc	mg/kg wet	26.5	21.8	23.2	15	15.3	47.8	20.3	17.1	18.4	19.2	22.1	26.3	31	16.4	22.7	20.2	23.6	20.8	26.9	24.3	36.4	26.1
Total Lipids	% wet	1.9	2.2	1.6	2.3	1.1	1.6	2	3.6	1.7	1.4	1.9	1.5	1.5	2.4	1.4	2	2.2	2.1	2.5	2	1	2.7

Client Ecoscape Env
Attention Kyle Hawes
Project Name TECK- AREMF
Project Number Fish Tissue

Please refer to PDF / Hardcopy

Analyte	Units		
		3061020-FJ	3061020-FK
		742	270
		16-May-13	15-May-13
		18-Jun-13	18-Jun-13
		Tissue	Tissue
Moisture	% wet	76.3	86.4
Aluminum	mg/kg wet	1.5	0.7
Antimony	mg/kg wet	0.004	0.092
Arsenic	mg/kg wet	0.084	0.337
Barium	mg/kg wet	7.43	2.94
Beryllium	mg/kg wet	<0.002	<0.002
Bismuth	mg/kg wet	<0.02	<0.02
Boron	mg/kg wet	0.2	0.2
Cadmium	mg/kg wet	0.061	0.467
Calcium	mg/kg wet	13400	9700
Cesium	mg/kg wet	0.02	0.16
Chromium	mg/kg wet	0.03	0.01
Cobalt	mg/kg wet	0.037	0.036
Copper	mg/kg wet	0.72	0.81
Iron	mg/kg wet	10	6
Lead	mg/kg wet	0.199	5.77
Magnesium	mg/kg wet	353	329
Manganese	mg/kg wet	8.8	4.96
Mercury	mg/kg wet	0.037	0.043
Molybdenum	mg/kg wet	0.03	0.02
Nickel	mg/kg wet	0.04	0.04
Phosphorus	mg/kg wet	7470	5990
Potassium	mg/kg wet	2560	2200
Rubidium	mg/kg wet	4.01	3.96
Selenium	mg/kg wet	0.61	0.53
Silver	mg/kg wet	0.003	0.018
Sodium	mg/kg wet	916	640
Strontium	mg/kg wet	34.9	19.7
Thallium	mg/kg wet	0.028	0.318
Tin	mg/kg wet	<0.02	<0.02
Titanium	mg/kg wet	0.4	0.3
Uranium	mg/kg wet	0.011	0.014
Vanadium	mg/kg wet	0.17	0.07
Zinc	mg/kg wet	37.1	42.9
Total Lipids	% wet	1.8	1.2

SCULPIN CONDITION and TISSUE METAL CONCENTRATION ANCOVA RESULTS:

Condition indices:

CONDITION FACTOR (K)

```
Call:
lm(formula = Condition ~ treatment2 + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.67050 -0.14321 -0.00485  0.09946  0.57364 

Coefficients:
              Estimate Std. Error t value Pr(>|t|)    
(Intercept)    1.34155    0.02334  57.482  < 2e-16 ***
treatment2Ref  0.02682    0.02540   1.056    0.292    
SexM          -0.02817    0.02945  -0.957    0.340    
SexU          -0.24104    0.03167  -7.610 6.52e-13 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1934 on 236 degrees of freedom
Multiple R-squared:  0.2256,    Adjusted R-squared:  0.2158 
F-statistic: 22.92 on 3 and 236 DF,  p-value: 4.667e-13
```

LIVERSOMATIC INDEX

```
Call:
lm(formula = Liversomatic.Index ~ treatment2 + Sex + Total.Length)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.49456 -0.39302 -0.05933  0.34227  2.08096 

Coefficients:
               Estimate Std. Error t value Pr(>|t|)    
(Intercept)    1.087334   0.224442   4.845 2.43e-06 ***
treatment2Ref -0.025728   0.080420  -0.320    0.749    
SexM          -0.950512   0.091594 -10.377  < 2e-16 ***
SexU          -0.635929   0.114049  -5.576 7.34e-08 ***
Total.Length   0.014147   0.002766   5.114 6.96e-07 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5828 on 215 degrees of freedom
Multiple R-squared:  0.395,     Adjusted R-squared:  0.3837 
F-statistic: 35.09 on 4 and 215 DF,  p-value: < 2.2e-16
```

GONADOSOMATIC INDEX (male)

```
Call:
lm(formula = Gonadosomatic.Index ~ treatment2 + Total.Length)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.29204 -0.44360  0.01797  0.28170  1.61642 
```

```
Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)        3.401133   0.513713   6.621 1.27e-08 ***
treatment2[T.Ref]  0.129138   0.171739   0.752    0.455    
Total.Length      -0.023132   0.005221  -4.431 4.23e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6399 on 58 degrees of freedom
Multiple R-squared:  0.2952,   Adjusted R-squared:  0.2708 
F-statistic: 12.14 on 2 and 58 DF,  p-value: 3.933e-05
```

GONADOSOMATIC INDEX (female)

```
Call:
lm(formula = Gonadosomatic.Index ~ treatment2 + Total.Length)

Residuals:
    Min      1Q  Median      3Q     Max 
-15.569  -3.031   1.034   4.453  11.358 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)   
(Intercept)       15.974826   4.858332   3.288  0.00181 **
treatment2[T.Ref]  0.442916   1.725268   0.257  0.79841   
Total.Length      -0.006615   0.060682  -0.109  0.91361   
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.272 on 52 degrees of freedom
Multiple R-squared:  0.001334,Adjusted R-squared:  -0.03708 
F-statistic: 0.03474 on 2 and 52 DF,  p-value: 0.9659
```

Condition Component Models (weights corrected for body size):

BODY WEIGHT

```
Call:
lm(formula = log(weight) ~ log(Total.Length) * treatment2 + Sex * 
    treatment2)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.33439 -0.09351 -0.00207  0.09049  0.36694 

Coefficients:
                                Estimate Std. Error t value Pr(>|t|)    
(Intercept)                    -12.13785    0.26052 -46.590   <2e-16 *
**
log(Total.Length)                3.20736    0.06017  53.301   <2e-16 *
**
treatment2Ref                    0.23955    0.44273   0.541   0.5890    
SexM                            -0.01682    0.02831  -0.594   0.5529    
SexU                            -0.10162    0.03433  -2.960   0.0034 *
*
log(Total.Length):treatment2Ref -0.04657    0.10141  -0.459   0.6465    
treatment2Ref:SexM              -0.03593    0.04334  -0.829   0.4080    
treatment2Ref:SexU              -0.05865    0.05665  -1.035   0.3016    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1389 on 231 degrees of freedom
```

```
Multiple R-squared:  0.9723,   Adjusted R-squared:  0.9714
F-statistic:  1157 on 7 and 231 DF,  p-value: < 2.2e-16
```

LIVER WEIGHT

```
Call:
lm(formula = log(liver.weight) ~ log(weight) * treatment2 + Sex *
    treatment2)

Residuals:
     Min       1Q   Median       3Q      Max
-1.50747 -0.24771  0.02987  0.24141  1.38132

Coefficients:
                          Estimate Std. Error t value Pr(>|t|)
(Intercept)               -4.39811    0.10740 -40.949  < 2e-16 ***
log(weight)                1.27242    0.05428  23.443  < 2e-16 ***
treatment2Ref              0.32436    0.20100   1.614  0.10806
SexM                      -0.44753    0.07939  -5.637 5.46e-08 ***
SexU                      -0.27233    0.10039  -2.713  0.00722 **
log(weight):treatment2Ref -0.13018    0.09621  -1.353  0.17747
treatment2Ref:SexM        -0.28430    0.12179  -2.334  0.02051 *
treatment2Ref:SexU        -0.17963    0.16940  -1.060  0.29017
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3863 on 213 degrees of freedom
Multiple R-squared:  0.8579,   Adjusted R-squared:  0.8533
F-statistic: 183.7 on 7 and 213 DF,  p-value: < 2.2e-16
```

GONAD WEIGHT (male)

```
Call:
lm(formula = log(gonad.weight) ~ weight * treatment2)

Residuals:
    Min      1Q  Median      3Q     Max
-1.6008 -0.3316  0.1056  0.3386  1.2530

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          -2.40395    0.20698 -11.614   <2e-16 ***
weight                0.01439    0.01219   1.180    0.243
treatment2Ref        -0.21939    0.29606  -0.741    0.462
weight:treatment2Ref  0.02814    0.02333   1.206    0.233
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5842 on 57 degrees of freedom
Multiple R-squared:  0.09539,  Adjusted R-squared:  0.04777
F-statistic: 2.003 on 3 and 57 DF,  p-value: 0.1237
```

GONAD WEIGHT (female)

```
Call:
lm(formula = gonad.weight ~ weight * treatment2)

Residuals:
     Min       1Q   Median       3Q      Max
-1.08855 -0.24199  0.06499  0.29521  0.95178
```

```
Coefficients:
                      Estimate Std. Error t value Pr(>|t|)    
(Intercept)          -0.251648   0.149179  -1.687   0.0979 .  
weight                0.202184   0.016382  12.342   <2e-16 ***
treatment2Ref        -0.046394   0.230155  -0.202   0.8411    
weight:treatment2Ref -0.004157   0.023406  -0.178   0.8597    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.4633 on 50 degrees of freedom
Multiple R-squared:  0.8559,   Adjusted R-squared:  0.8473 
F-statistic: 99.02 on 3 and 50 DF,  p-value: < 2.2e-16
```

Tissue Metals:

ARSENIC

```
lm(formula = log(Arsenic) ~ treatment2 + Total.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.15137 -0.35614 -0.07421  0.29463  1.87457 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)       -0.923869   0.185910  -4.969 1.29e-06 ***
treatment2[T.Ref] -0.436900   0.066586  -6.561 3.37e-10 ***
Total.Length      -0.021295   0.002278  -9.349  < 2e-16 ***
Sex[T.M]           0.053207   0.078395   0.679    0.498    
Sex[T.U]           0.108745   0.094920   1.146    0.253    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.506 on 235 degrees of freedom
Multiple R-squared:  0.4694,   Adjusted R-squared:  0.4603 
F-statistic: 51.97 on 4 and 235 DF,  p-value: < 2.2e-16
```

CADMIUM

```
lm(formula = log(Cadmium) ~ treatment2 + Total.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-1.54158 -0.43206 -0.04147  0.44604  1.90024 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)       -1.243840   0.245156  -5.074 7.93e-07 ***
treatment2[T.Ref] -0.925636   0.087805 -10.542  < 2e-16 ***
Total.Length      -0.015180   0.003004  -5.054 8.71e-07 ***
Sex[T.M]          -0.029556   0.103378  -0.286    0.775    
Sex[T.U]           0.008424   0.125168   0.067    0.946    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6673 on 235 degrees of freedom
Multiple R-squared:  0.4128,   Adjusted R-squared:  0.4028 
F-statistic:  41.3 on 4 and 235 DF,  p-value: < 2.2e-16
```

CHROMIUM

```
lm(formula = Chromium ~ treatment2 + Total.Length + Sex)

Residuals:
```

```
      Min        1Q    Median        3Q       Max 
-0.018016 -0.006132 -0.002968  0.005801  0.034434 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)        1.569e-02  3.787e-03   4.145 4.77e-05 ***
treatment2[T.Ref]  2.038e-03  1.355e-03   1.504    0.134    
Total.Length      -2.000e-05  4.641e-05  -0.431    0.667    
Sex[T.M]          -4.661e-04  1.597e-03  -0.292    0.771    
Sex[T.U]           1.544e-03  1.928e-03   0.801    0.424    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.01026 on 233 degrees of freedom
Multiple R-squared:  0.01964,	Adjusted R-squared:  0.002806 
F-statistic: 1.167 on 4 and 233 DF,  p-value: 0.3262
```

COPPER

```
lm(formula = log(Copper) ~ treatment2 + Total.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.74030 -0.19964 -0.03976  0.16805  1.46943 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)       -0.096452   0.112435  -0.858  0.39185    
treatment2[T.Ref] -0.274073   0.040270  -6.806 8.28e-11 ***
Total.Length      -0.004480   0.001378  -3.252  0.00132 ** 
Sex[T.M]           0.058195   0.047412   1.227  0.22089    
Sex[T.U]           0.073634   0.057405   1.283  0.20086    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.306 on 235 degrees of freedom
Multiple R-squared:  0.2366,	Adjusted R-squared:  0.2236 
F-statistic: 18.21 on 4 and 235 DF,  p-value: 4.794e-13
```

IRON

```
lm(formula = log(Iron) ~ treatment2 + Total.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.65746 -0.18129 -0.03312  0.19371  0.94544 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)        2.5063696  0.1070066  23.423  < 2e-16 ***
treatment2[T.Ref] -0.1779853  0.0383254  -4.644 5.69e-06 ***
Total.Length      -0.0007327  0.0013111  -0.559    0.577    
Sex[T.M]          -0.0754181  0.0451228  -1.671    0.096 .  
Sex[T.U]          -0.0346926  0.0546341  -0.635    0.526    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2913 on 235 degrees of freedom
Multiple R-squared:  0.1025,	Adjusted R-squared:  0.08723 
F-statistic:  6.71 on 4 and 235 DF,  p-value: 3.948e-05
```

LEAD

```
lm(formula = log(Lead) ~ treatment2 + Total.Length + Sex)
```

```
Residuals:
    Min      1Q  Median      3Q     Max 
-4.8638 -0.5584 -0.0920  0.5850  2.7096 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)        0.823367   0.336590   2.446  0.01517 *  
treatment2[T.Ref] -1.769643   0.120553 -14.679  < 2e-16 ***
Total.Length      -0.011225   0.004124  -2.722  0.00698 ** 
Sex[T.M]          -0.040248   0.141934  -0.284  0.77699    
Sex[T.U]          -0.069507   0.171852  -0.404  0.68624    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9162 on 235 degrees of freedom
Multiple R-squared:  0.5002,	Adjusted R-squared:  0.4917 
F-statistic:  58.8 on 4 and 235 DF,  p-value: < 2.2e-16
```

MERCURY

```
lm(formula = Mercury ~ treatment2 + Total.Length + Sex)

Residuals:
      Min        1Q    Median        3Q       Max 
-0.028181 -0.006583 -0.001477  0.004582  0.039390 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)        1.856e-02  3.472e-03   5.347 2.14e-07 ***
treatment2[T.Ref] -4.769e-03  1.216e-03  -3.923 0.000115 ***
Total.Length       1.678e-04  4.268e-05   3.931 0.000112 ***
Sex[T.M]          -2.582e-03  1.435e-03  -1.799 0.073324 .  
Sex[T.U]          -1.020e-03  1.737e-03  -0.587 0.557798    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.009177 on 231 degrees of freedom
Multiple R-squared:  0.1399,	Adjusted R-squared:  0.125 
F-statistic: 9.393 on 4 and 231 DF,  p-value: 4.736e-07
```

SELENIUM

```
lm(formula = Selenium ~ treatment2 + Total.Length + Sex)

Residuals:
     Min       1Q   Median       3Q      Max 
-0.39268 -0.08173 -0.02240  0.06698  0.56847 

Coefficients:
                    Estimate Std. Error t value Pr(>|t|)    
(Intercept)        0.8032360  0.0483532  16.612  < 2e-16 ***
treatment2[T.Ref]  0.0034168  0.0173182   0.197    0.844    
Total.Length      -0.0009390  0.0005925  -1.585    0.114    
Sex[T.M]          -0.1051744  0.0203897  -5.158 5.30e-07 ***
Sex[T.U]          -0.1004544  0.0246876  -4.069 6.45e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.1316 on 235 degrees of freedom
Multiple R-squared:  0.1293,	Adjusted R-squared:  0.1145 
F-statistic: 8.724 on 4 and 235 DF,  p-value: 1.393e-06
```

THALLIUM

```
lm(formula = log(Thallium) ~ treatment2 + Total.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-5.0810 -0.4644 -0.0240  0.3920  2.8575 

Coefficients:
                   Estimate Std. Error t value Pr(>|t|)    
(Intercept)       -2.984458   0.345002  -8.651 8.17e-16 ***
treatment2[T.Ref] -1.158548   0.123566  -9.376  < 2e-16 ***
Total.Length      -0.015768   0.004227  -3.730  0.00024 ***
Sex[T.M]          -0.218793   0.145481  -1.504  0.13394    
Sex[T.U]          -0.135684   0.176147  -0.770  0.44190    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.9391 on 235 degrees of freedom
Multiple R-squared:  0.3416,	Adjusted R-squared:  0.3304 
F-statistic: 30.48 on 4 and 235 DF,  p-value: < 2.2e-16
```

ZINC

```
lm(formula = Zinc ~ treatment2 + Total.Length + Sex)

Residuals:
    Min      1Q  Median      3Q     Max 
-19.041  -6.487  -1.849   4.337  38.877 

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)    
(Intercept)        48.0553     3.5259  13.629  < 2e-16 ***
treatment2[T.Ref]  -6.9287     1.2628  -5.487 1.06e-07 ***
Total.Length       -0.1822     0.0432  -4.218 3.52e-05 ***
Sex[T.M]           -1.5551     1.4868  -1.046    0.297    
Sex[T.U]           -0.7206     1.8002  -0.400    0.689    
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 9.598 on 235 degrees of freedom
Multiple R-squared:  0.2207,	Adjusted R-squared:  0.2075 
F-statistic: 16.64 on 4 and 235 DF,  p-value: 5.049e-12
```

APPENDIX J

WILDLIFE MODELLING – REPORT (INTRINSIK 2014)

SCIENCE INTEGRITY KNOWLEDGE

intrinsik

WILDLIFE MODELLING IN SUPPORT OF THE AQUATIC RECEIVING ENVIRONMENT MONITORING PROGRAM (AREMP)

FINAL REPORT
January 9, 2014

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WILDLIFE MODELLING IN SUPPORT OF THE AQUATIC RECEIVING ENVIRONMENT MONITORING PROGRAM (AREMP)

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WILDLIFE MODELLING IN SUPPORT OF THE AQUATIC RECEIVING ENVIRONMENT MONITORING PROGRAM (AREMP)

1.0 INTRODUCTION

A previously conducted terrestrial ecological risk assessment (EcoRA) (Cantox Environmental 2003, Intrinsik 2007) included evaluation of risks to birds and mammals that are linked to the aquatic environment. As part of the Aquatic Receiving Environment Monitoring Program (AREMP), Teck wished to evaluate ecological risks to these wildlife species using current monitoring data.

The objectives of the wildlife component of AREMP (Golder 2012) are:

1. Determine the current risks to Belted Kingfisher, Great Blue Heron, Mallard, Osprey, and the River Otter in the lower Columbia River based on current (2012/2013) data.
2. Evaluate how current risks relate to those predicted in the Terrestrial ERA (Cantox Environmental 2003, Intrinsik 2007).

The current assessment used water (*i.e.,* total metal concentrations), sediment, whole small-bodied fish tissue and benthic invertebrate tissue (*i.e.,* mussels and other benthic invertebrates) data collected by Ecoscape in 2012 and 2013, and estimated risks to five species with aquatic-based diets: Belted Kingfisher, Great Blue Heron (a listed species), Mallard, Osprey, and River Otter. A comparison was made to risks predicted in the EcoRA report (Intrinsik 2007).

2.0 DATA SUMMARY

The following Potential Contaminants of Concern (PCOC) were assessed for risk to wildlife receptors linked to the aquatic environment:

- Arsenic;
- Cadmium;
- Chromium;
- Cobalt;
- Copper;
- Lead;
- Mercury;
- Nickel;
- Selenium;
- Silver;
- Thallium; and
- Zinc.

The following statistics were calculated for each PCOC and sample medium:

- Average ± standard deviation;
- Range (minimum to maximum);
- 95% Upper Confidence Limit on the Mean (95UCLM) estimated using ProUCL software (US EPA 2011);
- Percent (%) non-detect concentrations (ND);
- 5th, 50th, and 95th percentiles; and,
- Distribution model used to estimate the 95UCLM.

Non-detect measurements were substituted with a value equivalent to the method detection limit (MDL) for statistical calculation purposes. ProUCL software was not used to consider the non-detect data because using ProUCL software rather than the proxy method generally does not result in a significant effect on the predicted risks. The proxy method also is slightly more conservative. The 95UCLM was not calculated when non-detect data exceeded 80% of the data set, because any statistical analysis under these conditions is likely to result in unacceptably high error rates (Helsel 2005). In these cases, only the range in concentrations was reported. Also, typically, a sample size greater than 8 to 10 observations is recommended to estimate a reliable 95UCLM (US EPA 2011).

The assessment characterized sample data as upstream or downstream of the smelter. Table 1 provides a summary of where the sampling sites are located along the Columbia River relative to the location of the smelter. Sampling sites are identified as either upstream or downstream of the facility, according to the sample site and map number used in Ecoscape and Larratt (2013). Summary statistics were separated into upstream and downstream locations to facilitate evaluation of potential effects of the smelter in the aquatic environment.

Table 1 Designation of Sampling Sites Relative to Facility Location

Designation	***Map #*** ***(1)***	***Deposition and Erosional Sample Site***	***Water Quality Sample Site***	***Fish Sampling Site***
Upstream	1	DEP-REF-1 Kootenay E		Koot-Ref
Upstream	2	DEP-REF-2 Genelle		Ero-Ref-3 (Genelle)
Upstream	3	DEP-REF-3 Birchbank, ero-ref-2-1, ero-ref-2-2, ero-ref-2-3, ero-ref-2-4, ero-ref-2-5	ID-1-Birchbank, ID-2-Birchbank, ID-3-Birchbank, ID-4-Birchbank, ID-5-Birchbank, ID-6-Birchbank	Ero-Ref-2
Upstream	4	ero-ref-1-1, ero-ref-1-2, ero-ref-1-3, ero-ref-1-4, ero-ref-1-5	ID-22 Stoney Creek, ID-23 Stoney Creek, ID-24 Stoney Creek	Ero-Exp-1
Downstream	4	ero-exp-1-1, ero-exp-1-2, ero-exp-1-3, ero-exp-1-4, ero-exp-1-5	ID-19 Stoney Creek, ID-20 Stoney Creek, ID-21 Stoney Creek	
Downstream	5	ero-exp-2-1, ero-exp-2-2, ero-exp-2-3, ero-exp-2-4, ero-exp-2-5		Ero-Exp-2
Downstream	6	DEP-EXP-1 Korpac, ero-exp-3-1, ero-exp-3-2, ero-exp-3-3, ero-exp-3-4, ero-exp-3-5	ID-25 New Bridge, ID-26 New Bridge, ID-27 New Bridge, ID-28 New Bridge, ID-29 New Bridge, ID-30 New Bridge, ID- 13 Old Bridge, ID- 14 Old Bridge, ID- 15 Old Bridge, ID- 16 Old Bridge, ID- 17 Old Bridge, ID- 18 Old Bridge	Ero-Exp-3
Downstream	7	DEP-EXP-2 Maglios, ero-exp-4-1, ero-exp-4-2, ero-exp-4-3, ero-exp-4-4, ero-exp-4-5		Ero-Exp-4
Downstream	8	DEP-EXP-3 Casino, DEP-EXP-4 Airport B, ero-exp-5-1, ero-exp-5-2,		Ero-Exp-5
Downstream	9	DEP-EXP-5 Trimac		
Downstream	10	DEP-EXP-6 Ft. S, DEP-EXP-7 Waneta, ero-exp-5-3, ero-exp-5-4, ero-exp-5-5	ID-7-Waneta, ID-8-Waneta, ID-9-Waneta, ID-10-Waneta, ID-11-Waneta, ID-12-Waneta	

(1) See maps in Ecoscape and Larratt (2013)

2.1 Metal Concentrations in Columbia River Sediments

Ten sediment samples were collected in October of 2012 from the Columbia River and analysed using the Strong Acid Leachable Metals (SALM) method for metal concentrations. The 10 sites were:

- Kootenay Eddy;
- Genelle Eddy;
- Birchbank;
- Korpac;
- Maglios;
- Casino;
- Airport B;
- Trimac;
- Fort Shepherd; and,
- Waneta.

Summaries of upstream and downstream metal concentrations in sediment are presented in Table 2 and Table 3, respectively.

Table 2 Statistical Summary of Metal Concentrations in Upstream Columbia River Sediment

Chemical	***Sediment Concentration [mg/kg]***				
	Average[(1)]	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)[(2)]***	***%ND***	***Percentile (5th), (50th), (95th)***
Arsenic	0.8	0.6 to 1.1	NA (3)	0	0.6, 0.8, 1
Cadmium	0.2	0.09 to 0.3	NA (3)	0	0.1, 0.2, 0.3
Chromium	16	15 to 18	NA (3)	0	15, 15, 18
Cobalt	2.7	2.2 to 3	NA (3)	0	2.3, 3, 3
Copper	5.4	4 to 6.3	NA (3)	0	4.2, 5.8, 6.3
Lead	7.5	4.9 to 9.9	NA (3)	0	5.2, 7.8, 9.7
Mercury	0.05	0.05 to 0.05	NA (3)	100	0.05, 0.05, 0.05
Nickel	8.3	6.1 to 9.7	NA (3)	0	6.4, 9.1, 9.6
Selenium	0.5	0.5 to 0.5	NA (3)	100	0.5, 0.5, 0.5
Silver	0.2	0.2 to 0.2	NA (3)	100	0.2, 0.2, 0.2
Thallium	0.1	0.1 to 0.1	NA (3)	100	0.1, 0.1, 0.1
Zinc	60	38 to 71	NA (3)	0	41, 70, 71

Notes:
ND = Not Detected
NA = Not Applicable. Not enough data points were available to calculate the 95% UCLM
(1) Insufficient data were available to calculate the Standard Deviation
(2) Analytical sediment data were only available from 3 of 4 sites designated as “upstream”

Table 3 Statistical Summary of Metal Concentrations in Downstream Columbia River Sediment

Chemical	***Sediment Concentration [mg/kg]***				
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***% ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	8.5 +/- 3.2	4.9 to 14	0	5.2, 7.1, 13	Student’s-t
Cadmium	0.97 +/- 0.43	0.5 to 1.7	0	0.5, 1.1, 1.6	Student’s-t
Chromium	29 +/- 6.7	19 to 39	0	21, 30, 38	Student’s-t
Cobalt	9.6 +/- 3.55	5.4 to 17	0	6.2, 9.1, 15	Student’s-t
Copper	287 +/- 196	100 to 670	0	106, 250, 580	Student’s-t
Lead	111 +/- 42.8	62 to 170	0	65.3, 100, 167	Student’s-t
Mercury	0.13 +/- 0.06	0.05 to 0.21	43	0.056, 0.12, 0.20	Student’s-t
Nickel	12 +/- 3.0	10 to 18	0	10, 11, 17	App.Gamma
Selenium	0.7 +/- 0.2	0.5 to 1	30	0.5, 0.6, 0.9	Student’s-t
Silver	2.0 +/- 1.8	0.6 to 5.7	0	0.66, 1.4, 4.8	App.Gamma
Thallium	0.2 +/- 0.1	0.1 to 0.4	30	0.1, 0.2, 0.3	App.Gamma
Zinc	1790 +/- 1260	650 to 4200	0	689, 1400, 3660	Student’s-t

Notes:
ND = Not Detected

2.2 Metal Concentrations in Small-bodied Fish

During May of 2013, 239 small-bodied fish samples of prickly sculpin (CAS), Columbia sculpin (CHU) and torrent sculpin (CRH) were collected from upstream and downstream locations. PCOC concentrations were measured in whole fish samples. Small-bodied fish ranged in length from 4 to 13 centimeters. In general, fish consumed by the wildlife assessed in this report are expected to be less than 20 centimeters in length (US EPA 1993). Therefore, the small-bodied fish were used to predict exposures to PCOC.

Differences in measured concentrations of PCOC in the different species of small-bodied fish were not apparent when box plots of fish species PCOC concentrations were compared (data not shown). This visual inspection indicates that the three species of small bodied fish can be combined into a single data set for statistical summaries. Whole body fish concentrations were reported in wet weight but were converted to dry weight for the statistical summary and for exposure modelling. The average and standard deviation moisture content in small bodied fish was measured to be 76% ± 2.9. Table 4 and Table 5 present the statistical summaries of concentrations measured in upstream and downstream fish, respectively.

Table 4 Statistical Summary of Metal Concentrations in Upstream Columbia River Small-bodied Fish Species

Chemical	***Small Bodied Fish Concentration [mg/kg-DW]***					
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	0.38+/-0.4	0.085 to 3.0	0.53 (130)	0	0.12, 0.25, 1.0	Chebyshev
Cadmium	0.27+/-0.25	0.032 to 1.43	0.311 (130)	0	0.06, 0.19, 0.8	H-UCL
Chromium	0.081 +/-0.082	0.035 to 0.83	0.12 (130)	15	0.037, 0.07, 0.17	Chebyshev
Cobalt	0.14 +/- 0.053	0.038 to 0.26	0.15 (130)	0	0.054, 0.12, 0.23	App.Gamma
Copper	2.3 +/-0.72	1.0 to 5.4	2.4 (130)	0	1.5, 2.3, 3.4	App.Gamma
Lead	2.37 +/- 3.83	0.09 to 21.8	3.834 (130)	0	0.22, 0.8, 10.43	Chebyshev
Mercury	0.12 +/- 0.076	0.03 to 0.65	0.14 (130)	0	0.06, 0.11, 0.20	Student's-t
Nickel	0.2 +/-0.07	0.02 to 0.4	0.2 (130)	0	0.08, 0.2, 0.3	App.Gamma
Selenium	2.8 +/- 0.55	1.5 to 4.8	2.8 (130)	0	2.1, 2.7, 3.7	Student's-t
Silver	0.02 +/- 0.02	0.007 to 0.08	0.03 (130)	60	0.008, 0.01, 0.05	Chebyshev
Thallium	0.03+/- 0.02	0.002 to 0.1	0.03 (130)	1	0.008, 0.02, 0.06	H-UCL
Zinc	116 +/- 38.7	54 to 205	122 (130)	0	65.3, 108, 191	App.Gamma

Notes:
ND = Not Detected
DW = Dry Weight

Table 5 Statistical Summary of Metal Concentrations in Downstream Columbia River Small-bodied Fish Species

Chemical	***Small Bodied Fish Concentration [mg/kg-DW]***					
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	0.43 +/-0.38	0.07 to 2.5	0.49 (109)	0	0.09, 0.3, 1.0	H-UCL
Cadmium	0.6 +/- 0.7	0.08 to 4.4	0.91 (109)	0	0.1, 0.4, 2.4	Chebyshev
Chromium	0.08 +/- 0.05	0.04 to 0.44	0.091 (92)	16	0.04, 0.08, 0.16	Student's-t

Cobalt	0.19 +/- 0.1	0.05 to 0.57	0.21 (109)	0	0.06, 0.17, 0.37	Student's-t
Copper	3.3 +/- 1.9	1.3 to 14	3.6 (109)	0	1.6, 2.8, 7.2	Student's-t
Lead	7.12 +/- 9.9	0.04 to 59.7	9.0 (109)	0	1, 3.8, 23	H-UCL
Mercury	0.12 +/- 0.05	0.06 to 0.34	0.13 (108)	1	0.07, 0.12, 0.19	App.Gamma
Nickel	0.2 +/- 0.07	0.07 to 0.4	0.2 (109)	0	0.08, 0.2, 0.3	App.Gamma
Selenium	2.9 +/- 0.63	1.2 to 5.2	3.0 (109)	0	2.1, 2.8, 4.0	App.Gamma
Silver	0.04 +/- 0.04	0.01 to 0.2	0.06 (60)	50	0.01, 0.02, 0.1	Chebyshev
Thallium	0.2 +/- 0.3	0.01 to 2	0.3 (108)	1	0.02, 0.06, 0.6	Chebyshev
Zinc	150 +/- 60	56 to 426	159 (109)	0	79, 136, 262	App.Gamma

Notes:
ND = Not Detected
DW = Dry Weight

2.3 Metal Concentrations in Benthic Invertebrates

During October 2012, 13 samples of benthic invertebrates were collected from upstream and downstream of the smelter. Six samples of benthic invertebrates (excluding mussels) were collected and 7 samples of mussels were collected between the upstream and downstream sites. The samples were analysed using SALM for metal concentrations.

Table 6 and Table 7 present the benthic invertebrate (including mussel) concentrations measured in upstream and downstream samples, respectively. The benthic invertebrate and mussel data were combined to increase the sample size and to permit calculation of a more reliable 95UCLM. Although not all wildlife species may eat both benthic invertebrates and mussels, the combined data provide a range in potential tissue concentrations for invertebrates that may be exposed to PCOCs in sediments, pore water and overlying water. The benthic invertebrate and mussel sample data were analyzed in wet weight and converted to dry weight assuming moisture content of 83% (US EPA 1999).

Table 6 Statistical Summary of Metal Concentrations in Upstream Columbia River Benthic Invertebrates and Mussel

Chemical	***Tissue Concentration [mg/kg-WW]***				
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***
Arsenic	0.72 +/- 0.33	0.30 to 1.1	NA (5)	0	0.33, 0.87, 1.1
Cadmium	0.81 +/- 0.65	0.25 to 1.8	NA (5)	0	0.28, 0.49, 1.7
Chromium	0.6 +/- 0.8	0.1 to 2	NA (5)	0	0.08, 0.3, 2
Cobalt	0.23 +/- 0.23	0.08 to 0.6	NA (5)	0	0.08, 0.16, 0.55
Copper	3.0 +/- 2.2	0.5 to 6	NA (5)	0	0.72, 2.4, 5.7
Lead	0.85 +/- 0.16	0.74 to 0.97	NA (5)	0	0.75, 0.85, 0.96
Mercury	0.015 +/- 0.006	0.008 to 0.023	NA (5)	0	0.008, 0.015, 0.02
Nickel	0.8 +/- 1.1	0.13 to 2.6	NA (5)	0	0.13, 0.3, 2.2
Selenium	0.4 +/- 0.16	0.25 to 0.6	NA (5)	0	0.26, 0.39, 0.59
Silver	0.05 +/- 0.03	0.02 to 0.09	NA (5)	0	0.02, 0.05, 0.08
Thallium	0.007 +/- 0.006	0.003 to 0.02	NA (5)	0	0.003, 0.004,0.02
Zinc	30 +/- 17	12 to 57	NA (5)	0	13, 30, 52

Notes:
NA = Not Applicable. Not enough data points were available to calculate the 95% UCLM
ND = Not Detected
WW = Wet Weight

Table 7 Statistical Summary of Metal Concentrations in Downstream Columbia River Benthic Invertebrates and Mussel

Chemical	***Tissue Concentration [mg/kg-WW]***					
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	1.5 +/- 1.5	0.53 to 5.1	3.0 (8)	0	0.62, 1.1, 3.8	H-UCL
Cadmium	1.1 +/- 0.65	0.20 to 2.2	1.6 (8)	0	0.34, 0.91, 2.0	Student t
Chromium	1 +/- 2	0.08 to 7	5 (8)	0	0.08, 0.5, 5	App.Gamma
Cobalt	0.5 +/- 0.73	0.07 to 2.3	1.2 (8)	0	0.07, 0.22, 1.7	App.Gamma
Copper	15 +/- 19	1.3 to 51	42 (8)	0	1.5, 4.0, 46	App.Gamma
Lead	16 +/- 29	0.5 to 85	83 (8)	0	0.57, 3.4, 63	Adj.Gamma
Mercury	0.06 +/- 0.09	0.016 to 0.28	0.20 (8)	0	0.016, 0.027, 0.19	Chebyshev
Nickel	1.7 +/- 2.9	0.08 to 8.7	5.5 (8)	0	0.1, 0.51, 6.3	App.Gamma
Selenium	0.49 +/- 0.19	0.25 to 0.86	0.61 (8)	0	0.28, 0.46, 0.78	Student t
Silver	0.1 +/- 0.1	0.01 to 0.4	0.2 (8)	0	0.02, 0.06, 0.3	App.Gamma
Thallium	0.1 +/- 0.2	0.005 to 0.8	2 (8)	0	0.009, 0.02, 0.6	Hall's Bootstrap
Zinc	65 +/- 57	22 to 180	120 (8)	0	23, 39, 160	App.Gamma

Notes:
ND = Not Detected
WW = Wet Weight

2.4 Metal Concentrations in Columbia River Water

Between September 2012 and April 2013, 135 water quality samples were collected from upstream and downstream of the smelter using both grab and transect methods of sampling. The sites sampled along the Columbia River were:

1) Birchbank;
2) Stoney Creek;
3) New Bridge;
4) Old Bridge; and,
5) Waneta.

Table 8 and Table 9 present the water concentrations measured in the Columbia River upstream and downstream of the smelter, respectively. The summary statistics for all PCOC did not distinguish between sampling methods or locations along the river. Only the minimum, maximum and sample counts were reported for chromium, silver and mercury due to more than 80% of the samples being non-detect.

Table 8 Statistical Summary of Total Metal Concentrations in Upstream Columbia River

Chemical (Total)	***Water Concentration [µg/L]***					
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	0.24 +/- 0.097	0.15 to 0.62	0.28 (42)	0	0.15, 0.22, 0.46	Student's-t
Cadmium	0.014 +/- 0.011	0.0055 to 0.071	0.020 (42)	0	0.0064, 0.0099, 0.033	Chebyshev
Chromium	<0.1	<0.1	NA (42)	100	NA	NA
Cobalt	0.011 +/- 0.0021	0.0077 to 0.018	0.012 (42)	0	0.0084, 0.012, 0.014	Student's-t
Copper	0.33 +/- 0.082	0.2 to 0.66	0.34 (42)	0	0.23, 0.31, 0.45	Student's-t
Lead	0.059 +/- 0.027	0.030 to 0.17	0.066 (42)	0	0.031, 0.054, 0.11	App.Gamma
Mercury	0.0012	<0.0005 to <0.012	NA (42)	98	NA	NA
Nickel	0.32 +/- 0.027	0.24 to 0.38	0.33 (42)	0	0.28, 0.33, 0.36	Student's-t
Selenium	0.21 +/- 0.028	0.15 to 0.25	0.21 (42)	0	0.16, 0.22, 0.24	Student's-t
Silver	<0.005	<0.005	NA (42)	100	NA	NA
Thallium	0.0029 +/- 0.00052	0.002 to 0.0039	0.0030 (42)	33	0.0021, 0.0027, 0.0036	Student's-t
Zinc	1.6 +/- 0.85	0.7 to 3.8	1.7 (42)	0	0.71, 1.2, 3.3	Student's-t

Notes:
NA = Not Applicable. Not enough data points were available to calculate the 95% UCLM
ND = Not Detected

Table 9 Statistical Summary of Total Metal Concentrations in Downstream Columbia River

Chemical (Total)	***Water Concentration [µg/L]***					
	Average +/- Standard Deviation	***Range (Minimum to Maximum)***	***95UCLM (Sample Size)***	***%ND***	***Percentile (5th), (50th), (95th)***	***Model***
Arsenic	0.28 +/- 0.16	0.15 to 1.1	0.31 (93)	0	0.16, 0.25, 0.60	Student's-t
Cadmium	0.087 +/- 0.21	0.0061 to 0.95	0.21 (93)	0	0.0072, 0.029, 0.82	Chebyshev
Chromium	0.54 +/- 0.60	0.11 to 0.96	NA (93)	98	0.15, 0.54, 0.92	NA
Cobalt	0.015 +/- 0.016	0.0078 to 0.12	0.019 (93)	0	0.0089, 0.012, 0.027	Student's-t
Copper	0.39 +/- 0.20	0.19 to 1.2	0.44 (93)	0	0.21, 0.32, 0.88	Student's-t
Lead	0.19 +/- 0.33	0.011 to 1.86	0.37 (93)	0	0.033, 0.098, 0.88	Chebyshev
Mercury	0.0016 +/- 0.0017	0.00066 to 0.005	5.3 (93)	94	0.00075, 0.001, 0.004	Chebyshev
Nickel	0.32 +/- 0.059	0.24 to 0.81	0.34 (93)	0	0.27, 0.32, 0.36	Student's-t
Selenium	0.36 +/- 0.49	0.14 to 3.2	0.63 (93)	0	0.16, 0.23, 0.9	Chebyshev
Silver	<0.0050	<0.0050	NA (93)	100	NA	NA
Thallium	0.050 +/- 0.15	0.0021 to 1.1	0.13 (93)	10	0.0021, 0.0093, 0.23	Chebyshev
Zinc	2.5 +/- 2.9	0.63 to 16	4.2 (93)	1	0.84, 1.6, 11	Chebyshev

Notes:
NA = Not Applicable. Not enough data points were available to calculate the 95% UCLM
ND = Not Detected

3.0 EXPOSURE ASSESSMENT

The exposure assessment predicts the intake of PCOC by wildlife receptors. Exposure pathways are described in Section 3.1, diet assumptions are provided in Section 3.2, the exposure model is described in Section 3.3, and relative bioavailability assumptions are presented in Section 3.4.

3.1 Exposure Pathways

Exposure pathways describe the routes through which wildlife receptors come into contact with the PCOC in the environment (*e.g.*, food, sediment or water). The exposure model accounts for major pathways of exposure to PCOC through the use of PCOC in site-specific media consumed by receptors.

The following exposure pathways were evaluated in the risk assessment:

- *Ingestion of sediment:* Wildlife may ingest sediment while foraging.
- *Ingestion of water:* Wildlife may ingest water from the Columbia River. Water exposures were based on total PCOC concentrations.
- *Ingestion of benthic invertebrates*: Wildlife may ingest benthic invertebrates that have accumulated PCOC in their tissues.
- *Ingestion of fish:* Fish may be exposed to chemicals that deposit on or enter surface water bodies, through their ingestion of water or foods, and via gill uptake. These chemicals may accumulate in fish that may be consumed by wildlife.

Dermal and inhalation exposures were not evaluated in the assessment. These pathways of exposure are considered to be negligible for inorganic chemicals when compared to exposures through the diet (Suter *et al.* 2000).

3.2 Diet Apportionment

Diet apportionment for the wildlife receptors was based on availability of food items in the Columbia River, in combination with professional judgement and literature sources (US EPA 1993). Diet apportionment (Table 10) was adjusted from that used in the earlier terrestrial risk assessment to assume that the entire diet of each wildlife receptor was derived from the Columbia River. The percentages for benthic invertebrates and fish add up to 100% of the diet. The amount of sediment ingested is expressed as a percentage of diet ingested (*e.g.,* a wildlife species that ingests 100 g of food each day, and that ingests sediment at a rate of 1% of their diet ingested, would ingest 1 g of sediment each day).

Table 10 Diet Apportionment for Receptors Linked to the Aquatic Environment

Receptor	***Benthic Invertebrates***	***Fish***	***Sediment***
Belted kingfisher	42%	58%	1%
Great blue heron	5%	95%	0%
Mallard	100%	0%	3.3%
Osprey	5%	95%	1%
River otter	5%	95%	1%

3.3 Exposure Model

The risk assessment model incorporated distributions of concentrations measured in the environment to evaluate risks on a probabilistic basis. An appropriate frequency distribution model was selected for each PCOC and dietary item based on ProUCL Software (US EPA 2011). The same statistical software used to estimate the 95UCLM was also used to identify the best distribution model that fit the data. However, exposures for wildlife were not based on confidence intervals about the mean, but were based on distributions selected in consideration of the full distribution of data. In general, the best distribution model that fit the data was used and distributions were parameterized based on the estimated 5th and 95th percentile. The following rationale and statistical parameters were used to define assumptions in the exposure model:

- Uniform distribution was defined by the minimum and maximum measured value. This model assumption was typically used when more than 80% of the sample data were non-detect. In addition, the minimum concentration value in uniform distributions is often the method detection limit.
- Normal distribution was defined by the estimated 5th and 95th percentile.
- Lognormal distribution was defined by the estimated 5th and 95th percentile.
- Gamma distribution was defined by the estimated 5th, 50th and 95th percentile. Gamma distributions were assumed when the data did not fit a parametric distribution (*i.e.*, normal or lognormal or gamma) and was defined by the estimated 5th, 50th and 95th percentile. This assumption was assumed to be reasonable given that the ProUCL software typically calculated a 95UCLM based on a non-parametric distribution model (Chebyshev or bootstrap) when data followed a highly positive and skewed distribution, or sample size was limited.

Samples of sediment and benthic invertebrate concentrations did not consist of co-located sampling; therefore, these input variables could not be correlated in the model. One might expect that higher concentrations of PCOCs in fish tissues would occur where higher concentrations of PCOCs exist in water and sediment. However, without the data to show this, the parameters in the model were assumed to interact independently and none of the input variables were correlated in the Monte Carlo simulation.

The probabilistic model and input assumptions used in the current assessment are presented in Appendices A and B, respectively. Appendix A presents the probabilistic model used to predict exposures and risks to the PCOC for each receptor. Appendix B presents input assumptions that were assumed for receptor body weights and media concentrations (*i.e.*, food, water and sediment concentrations) used to predict exposures.

Finally, the exposure model focused on downstream concentrations for input variables to estimate risks to wildlife foraging exclusively downstream of the smelter. The upstream data are presented in this report for comparison purposes only.

3.4 Relative Bioavailability

Predicted exposures were modified through the use of bioavailability factors for sediment and benthic invertebrate ingestion. All other pathways of exposure conservatively assumed 100% relative bioavailability. The project-specific sediment and benthic invertebrate relative absorption factors (RAFs) were based on those values assumed in the EcoRA report (Intrinsik 2007), and are presented in Table 11.

Table 11 Sediment and Benthic Invertebrate Relative Absorption Factors (RAFs) Assumed in the Exposure Assessment

Chemical	***Sediment***		***Benthic Invertebrate***
	Distribution Model Assumed[1]	***Parameter Value [%]***	***Parameter Value [%][2]***
Arsenic	Triangle	(20, 39, 52)	100
Cadmium	Point estimate	33	70
Chromium	Point estimate	100	100
Cobalt	Point estimate	100	100
Copper	Uniform	(20, 40)	70
Lead	Point estimate	50	30
Mercury (Inorganic)	Uniform	(5, 10)	100
Mercury (Organic)	Point estimate	100	100
Nickel	Point estimate	100	100
Selenium	Point estimate	100	100
Silver	Point estimate	100	100
Thallium	Point estimate	100	100
Zinc	Point estimate	50	60

(1) Distribution model defined as follows: Triangle (minimum, likeliest, maximum); Uniform (minimum, maximum); or point estimate (fixed value).

(2) All values reported as point estimates.

4.0 TOXICITY ASSESSMENT

Toxicity assessment involves the identification of a maximum dose to which wildlife species may be exposed without resulting in an unacceptable risk. A summary of the Toxicity Reference Values (TRVs) is provided in Table 12. The TRVs were taken from the terrestrial ERA reports (the Problem Formulation report, Cantox Environmental *et al.* 2001; the Level of Refinement (LOR) #2 report, Cantox Environmental 2003; and LOR#3 report, Intrinsik 2007). These TRVs are still considered current. For those PCOC not addressed in these reports, a brief description of the basis of the TRV is provided below.

4.1 Arsenic

The arsenic TRVs were taken from the Problem Formulation report or the LOR#2 report (Cantox Environmental *et al.* 2001; Cantox Environmental 2003).

4.2 Cadmium

The cadmium TRVs were taken from the Problem Formulation report (Cantox Environmental *et al.* 2001).

4.3 Chromium

The chromium TRVs were taken from the LOR#3 report (Intrinsik 2007).

4.4 Cobalt

There are limited studies available on the toxicity of cobalt to birds. The US EPA (2005) conducted a detailed review of published studies on avian and mammalian toxicity to determine those studies of sufficient quality to develop an Ecological Soil Screening Level (Eco-SSL). Endpoints included growth, reproduction and mortality. The lowest bounded LOAEL for birds was 7.8 mg/kg/d; this was used as the TRV for non-listed birds. The three lowest bounded NOAELs were between 3.9 and 4.3 mg/kg/d; the geometric mean of these values of 4.1 mg/kg/d was used as the TRV for great blue heron. The lowest bounded LOAEL for mammals was 11 mg/kg/d; this was used as the TRV for otter.

4.5 Copper

The copper TRVs for birds were taken from the LOR#3 report (Intrinsik 2007); the TRV for otter is from the Problem Formulation report (Cantox Environmental *et al.* 2001).

4.6 Lead

The lead TRVs for non-listed birds and otter were taken from the LOR#3 report (Intrinsik 2007). The TRV for great blue heron is the EC5, as calculated by US EPA (2001), from the same study that formed the basis of the TRV for non-listed birds (Edens and Garlich 1983).

4.7 Mercury

The inorganic mercury TRVs for birds were taken from the LOR#3 report (Intrinsik 2007); the TRV for otter was taken from the LOR#2 report (Cantox Environmental 2003).

The methyl mercury TRVs for birds were taken from the LOR#3 report (Intrinsik 2007); the TRV for otter was taken from the Problem Formulation report (Cantox Environmental *et al*. 2001).

4.8 Nickel

The nickel TRVs for birds were taken from the LOR#3 report (Intrinsik 2007). The TRV for otter was taken from Sample *et al.* 1996. It was based on a three generation reproductive study on rats exposed to nickel sulfate hexahydrate in the diet (Ambrose *et al.* 1976). The LOAEL was 80 mg/kg/d.

4.9 Selenium

The selenium TRVs for birds were taken from the LOR#3 report (Intrinsik 2007). The TRV for otter was taken from Sample *et al.* 1996. It was based on a three generation reproductive study on mice exposed to selete in drinking water (Schroeder and Mitchner 1971). The LOAEL was 0.76 mg/kg/d.

4.10 Silver

The silver TRVs were taken from the LOR#3 report (Intrinsik 2007).

4.11 Thallium

As discussed in the Problem Formulation report (Cantox Environmental *et al*. 2001), there are insufficient toxicity data for thallium to derive TRVs for birds. The TRV for otter was taken from the Problem Formulation report (Cantox Environmental *et al*. 2001).

4.12 Zinc

The zinc TRVs were taken from the Problem Formulation report (Cantox Environmental *et al*. 2001).

Table 12 Summary of Toxicity Reference Values

Chemical	***Receptor***	***TRV***	***Units***	***References***
Arsenic	Belted Kingfisher	14	mg/kg/day	Stanley *et al.* 1994 (EC20 calculated by US EPA 2001)
	Great Blue Heron	4.2	mg/kg/day	Stanley *et al.* 1994 (NOAEL)
	Mallard	14	mg/kg/day	Stanley *et al.* 1994 (EC20 calculated by US EPA 2001)
	Osprey	14	mg/kg/day	Stanley *et al.* 1994 (EC20 calculated by US EPA 2001)
	River Otter	0.2	mg/kg/day	Cantox Environmental *et al.* 2001
Cadmium	Belted Kingfisher	4.4	mg/kg/day	Cantox Environmental *et al.* 2001
	Great Blue Heron	0.4	mg/kg/day	Cantox Environmental *et al.* 2001
	Mallard	4.4	mg/kg/day	Cantox Environmental *et al.* 2001
	Osprey	4.4	mg/kg/day	Cantox Environmental *et al.* 2001
	River Otter	1.7	mg/kg/day	Cantox Environmental *et al.* 2001

Chemical	***Receptor***	***TRV***	***Units***	***References***
Chromium	Belted Kingfisher	5	mg/kg/day	Sample *et al.* 1996
	Great Blue Heron	1	mg/kg/day	Sample *et al.* 1996
	Mallard	5	mg/kg/day	Sample *et al.* 1996
	Osprey	5	mg/kg/day	Sample *et al.* 1996
	River Otter	13	mg/kg/day	Sample *et al.* 1996
Cobalt	Belted Kingfisher	7.8	mg/kg/day	US EPA 2005
	Great Blue Heron	4.1	mg/kg/day	US EPA 2005
	Mallard	7.8	mg/kg/day	US EPA 2005
	Osprey	7.8	mg/kg/day	US EPA 2005
	River Otter	11	mg/kg/day	US EPA 2005
Copper	Belted Kingfisher	72	mg/kg/day	Mehring *et al.* 1960 (EC20 calculated by US EPA 2001)
	Great Blue Heron	11	mg/kg/day	Vohra and Kratzer 1968
	Mallard	72	mg/kg/day	Mehring *et al.* 1960 (EC20 calculated by US EPA 2001)
	Osprey	72	mg/kg/day	Mehring *et al.* 1960 (EC20 calculated by US EPA 2001)
	River Otter	15	mg/kg/day	Aulerich *et al.* 1982
Lead	Belted Kingfisher	9.9	mg/kg/day	Edens and Garlich 1983 (EC20 calculated by US EPA 2001)
	Great Blue Heron	3	mg/kg/day	Edens and Garlich 1983 (EC5 calculated by US EPA 2001)
	Mallard	9.9	mg/kg/day	Edens and Garlich 1983 (EC20 calculated by US EPA 2001)
	Osprey	9.9	mg/kg/day	Edens and Garlich 1983 (EC20 calculated by US EPA 2001)
	River Otter	8	mg/kg/day	Azar *et al.* 1973
Mercury (Inorganic)	Belted Kingfisher	0.09	mg/kg/day	Hill and Shaffner 1976
	Great Blue Heron	0.045	mg/kg/day	Hill and Shaffner 1976
	Mallard	0.09	mg/kg/day	Hill and Shaffner 1976
	Osprey	0.09	mg/kg/day	Hill and Shaffner 1976
	River Otter	2.0	mg/kg/day	Dieter *et al.* 1992
Mercury (Organic)	Belted Kingfisher	0.77	mg/kg/day	US EPA 2001
	Great Blue Heron	0.068	mg/kg/day	US EPA 2001
	Mallard	0.77	mg/kg/day	US EPA 2001
	Osprey	0.77	mg/kg/day	US EPA 2001
	River Otter	0.1	mg/kg/day	Wobeser *et al.* 1976
Nickel	Belted Kingfisher	77	mg/kg/day	Cain and Pafford 1981
	Great Blue Heron	18	mg/kg/day	Cain and Pafford 1981
	Mallard	77	mg/kg/day	Cain and Pafford 1981
	Osprey	77	mg/kg/day	Cain and Pafford 1981
	River Otter	80	mg/kg/day	Sample *et al.* 1996
Selenium	Belted Kingfisher	0.8	mg/kg/day	Heinz *et al.* 1989
	Great Blue Heron	0.4	mg/kg/day	Heinz *et al.* 1989
	Mallard	0.4	mg/kg/day	Heinz *et al.* 1989
	Osprey	0.8	mg/kg/day	Heinz *et al.* 1989
	River Otter	0.76	mg/kg/day	Sample *et al.* 1996
Silver	Belted Kingfisher	200	mg/kg/day	Smith and Carson 1977
	Great Blue Heron	100	mg/kg/day	Hill *et al.* 1964
	Mallard	200	mg/kg/day	Smith and Carson 1977
	Osprey	200	mg/kg/day	Smith and Carson 1977
	River Otter	10	mg/kg/day	US EPA 1980
Thallium	Belted Kingfisher	n/a	mg/kg/day	
	Great Blue Heron	n/a	mg/kg/day	

Chemical	***Receptor***	***TRV***	***Units***	***References***
	Mallard	n/a	mg/kg/day	
	Osprey	n/a	mg/kg/day	
	River Otter	0.7	mg/kg/day	Cantox Environmental *et al.* 2001
Zinc	Belted Kingfisher	130	mg/kg/day	Gasaway and Buss 1972; Stahl *et al.* 1990
	Great Blue Heron	13	mg/kg/day	Gasaway and Buss 1972; Stahl *et al.* 1990
	Mallard	130	mg/kg/day	Gasaway and Buss 1972; Stahl *et al.* 1990
	Osprey	130	mg/kg/day	Gasaway and Buss 1972; Stahl *et al.* 1990
	River Otter	210	mg/kg/day	Cantox Environmental *et al.* 2001

Notes:
n/a indicates not available due to insufficient toxicological information available to derive a TRV.

5.0 RISK CHARACTERIZATION

Risk characterization involves the comparison of the exposure estimates against the TRVs in order to predict whether impacts might be associated with each of the PCOC. The potential risk is expressed as an Exposure Ratio (ER), calculated as follows:

$$Exposure\ Ratio\ (ER) = \frac{Exposure\ Estimate}{Toxicity\ Reference\ \ Value}$$

ER values followed similar methods of characterizing risks as presented in the Cantox Environmental (2003) and Intrinsik (2007) EcoRA reports. An ER value that is greater than 1.0 indicates that the estimated exposure level exceeds the TRV, and may pose an unacceptable risk to the receptor. ER values were generated for each chemical and receptor. The predicted ER values are not based on upper confidence limits about the mean, but rather on the full distribution of measured data. The risk assessment results are first reviewed to determine the probability of the ER exceeding an ER=1.0. The probabilities were interpreted as follows:

- Less than 10% probability of an ER greater than 1.0: signifies that most estimated exposures are less than the TRV, indicating that adverse effects can be ruled out.
- Equal or greater than 10% probability of an ER greater than 1.0: potential for adverse effects is not ruled out; however, the significance of this potential must be judged according to the uncertainty and degree of conservatism incorporated into the risk assessment, as well as site-specific information.

Predicted ER values for PCOC were conservatively based on the media concentration data from downstream of the smelter only. If risks are predicted to be acceptable based on downstream exposures, then risks to wildlife receptors in the upstream environment, or foraging over both areas, are also assumed to be acceptable.

The presentation of the probabilities of exceeding an ER of 1.0 in Table 13 does not include information regarding the magnitude of the exceedance. Therefore, the 90th percentile and 50th percentile ER values are also presented in Table 14 and Table 15, respectively.

The predicted probability of an ER value (Table 13) greater than 1.0 is less than 10% for all PCOC and receptor combinations. Therefore, adverse effects to wildlife with a diet closely linked to the aquatic environment downstream of the smelter are not expected. As noted above, PCOC concentrations upstream of the smelter were lower than those downstream of the smelter. Therefore, adverse effects to wildlife with a diet closely linked to the aquatic environment that forage upstream of the smelter, or both upstream and downstream of the smelter, are not expected.

Table 13 Probability of an ER Greater Than 1.0 in the Downstream Portion of the AOI

PCOC	***Belted Kingfisher***	***Great Blue Heron***	***Mallard***	***Osprey***	***River Otter***
Arsenic	0.0%	0.0%	0.0%	0.0%	1.1%
Cadmium	0.0%	0.0%	0.0%	0.0%	0.0%
Chromium	1.1%	0.0%	2.1%	0.0%	0.0%
Cobalt	0.0%	0.0%	0.0%	0.0%	0.0%

Copper	0.0%	0.0%	0.1%	0.0%	0.0%
Lead	4.9%	0.8%	6.7%	0.1%	0.0%
Mercury (Inorganic)	2.3%	0.0%	4.6%	0.0%	0.0%
Mercury (Organic)	0.0%	0.0%	0.0%	0.0%	0.0%
Nickel	0.0%	0.0%	0.0%	0.0%	0.0%
Selenium	2.3%	0.1%	1.0%	0.0%	0.0%
Silver	0.0%	0.0%	0.0%	0.0%	0.0%
Thallium	NA	NA	NA	NA	0.0%
Zinc	0.2%	7.0%	0.7%	0.0%	0.0%

Notes:
NA: not assessed due to lack of a TRV

Table 14 90th Percentile ER Value in the Downstream Portion of the AOI

PCOC	*Belted Kingfisher*	*Great Blue Heron*	*Mallard*	*Osprey*	*River Otter*
Arsenic	0.01	0.025	0.13	0.0081	0.45
Cadmium	0.16	0.20	0.20	0.020	0.041
Chromium	0.35	0.090	0.44	0.025	0.0071
Cobalt	0.078	0.0096	0.096	0.0065	0.0037
Copper	0.14	0.064	0.18	0.012	0.045
Lead	0.65	0.28	0.75	0.01	0.095
Mercury (Inorganic)	0.5	0.059	0.64	0.032	0.0011
Mercury (Organic)	0.039	0.16	0.032	0.015	0.094
Nickel	0.027	0.0064	0.033	0.0017	0.0013
Selenium	0.82	0.57	0.64	0.31	0.27
Silver	0.00056	0.000083	0.00073	0.000052	0.00083
Thallium	NA	NA	NA	NA	0.031
Zinc	0.37	0.93	0.38	0.11	0.054

Notes:
NA: not assessed due to lack of a TRV

Table 15 50th Percentile ER Value in the Downstream Portion of the AOI

PCOC	*Belted Kingfisher*	*Great Blue Heron*	*Mallard*	*Osprey*	*River Otter*
Arsenic	0.040	0.011	0.049	0.0039	0.21
Cadmium	0.094	0.096	0.11	0.0097	0.019
Chromium	0.052	0.015	0.073	0.0076	0.0022
Cobalt	0.017	0.0037	0.021	0.003	0.0016
Copper	0.024	0.024	0.029	0.0051	0.019
Lead	0.10	0.067	0.080	0.028	0.025
Mercury (Inorganic)	0.11	0.019	0.13	0.011	0.00036
Mercury (Organic)	0.019	0.099	0.0067	0.0097	0.055
Nickel	0.0035	0.0013	0.0043	0.00042	0.00031
Selenium	0.58	0.39	0.39	0.22	0.17
Silver	0.00016	0.000029	0.00019	0.000023	0.00033
Thallium	NA	NA	NA	NA	0.0052
Zinc	0.18	0.55	0.14	0.067	0.31

Notes:
NA: not assessed due to lack of a TRV

6.0 COMPARISON TO 2003/2007 RESULTS

In general, the predicted ER values in the current assessment are within an order of magnitude of the results from the 2003 or 2007 EcoRA. The predicted median and 90th percentile ER values from the 2003 (Cantox Environmental 2003) or 2007 (Intrinsik 2007) EcoRA are presented in Table 16 and Table 17, respectively. In addition to changes due to the use of current PCOC concentrations, the results may be slightly different between the two assessments due to some changes in the model. For example, in previous EcoRAs, Kingfishers were used to assess exposures to tributary concentrations, not those in the Columbia River mainstem. Also, amphibians collected from wetlands were included as part of the diet of kingfisher, heron, osprey and otter in the previous exposure models; amphibians were not included in the current assessment but replaced with small-bodied fish. In the previous EcoRAs, only large-bodied, whole-body fish concentrations were available; in the current assessment, small-bodied fish data were used, as smaller fish are more likely to be eaten by these wildlife species. Finally, all measured concentrations were used in the previous EcoRAs, whether samples were taken upstream or downstream of the smelter; only downstream samples were used in the current assessment.

Table 16 Predicted ERs from the 2003/2007 EcoRA (Median Exposure Model) Compared with 2013 ERs

PCOC	***Belted Kingfisher***		***Great Blue Heron***		***Mallard***		***Osprey***		***River Otter***	
	2003/ 2007	2013	2007	2013	2007	2013	2003/ 2007	2013	2007	2013
Arsenic	0.008(1)	0.04	0.020	0.011	0.020	0.049	0.003(1)	0.0039	0.20	0.21
Cadmium	0.015(1)	0.094	0.10	0.096	0.040	0.11	0.007(1)	0.0097	0.010	0.019
Chromium	0.090	0.052	0.040	0.015	0.11	0.073	0.010	0.0076	0.0030	0.0022
Cobalt	0.0030	0.017	0.0040	0.0037	NA	0.021	0.18(1)	0.003	NA	0.0016
Copper	0.39(1)	0.024	0.070	0.024	0.030	0.029	0.21(1)	0.0051	0.020	0.019
Lead	0.44(1)	0.10	0.30	0.067	0.10	0.080	0.011(1)	0.028	0.030	0.025
Mercury - Inorganic	0.044(1)	0.11	0.080	0.019	0.050	0.13	0.28(1)	0.011	0.0003	3.6x10^{-4}
Mercury - Organic	0.020	0.02	0.10	0.099	0.040	0.0067	NA	0.0097	0.090	0.055
Nickel	0.0070	0.0035	NA	0.0013	0.0090	0.0043	0.0010	4.2x10^{-4}	NA	3.1x10^{-4}
Selenium	0.23	0.58	0.25	0.39	ND	0.39	NA	0.22	NA	0.17
Silver	0.0008	0.0002	0.0005	9x10^{-5}	0.0007	1.9x10^{-4}	0.0003	2.3x10^{-5}	0.005	3.3x10^{-4}
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	0.0080	0.0052
Zinc	0.69(1)	0.18	0.60	0.55	0.20	0.14	0.37(1)	0.067	0.040	0.31

Notes:
NA: not assessed because TRV unavailable.
ND: no data.
(1) From 2003 EcoRA. All other ERs are from the 2007 EcoRA.

Table 17 Predicted ERs from the 2003/2007 EcoRA (90th Percentile Exposure Model) Compared with 2013 ERs

PCOC	**Belted Kingfisher**		**Great Blue Heron**		**Mallard**		**Osprey**		**River Otter**	
	2003/ 2007	2013	2007	2013	2007	2013	2003/ 2007	2013	2007	2013
Arsenic	0.016(1)	0.01	0.030	0.025	0.040	0.13	0.006(1)	0.0081	0.60	0.45
Cadmium	0.037(1)	0.16	0.20	0.20	0.10	0.20	0.019(1)	0.020	0.050	0.041
Chromium	0.17	0.35	0.11	0.090	0.20	0.44	0.030	0.025	0.010	0.0071
Cobalt	0.015	0.078	0.019	0.0096	NA	0.096	NA	0.0065	NA	0.0037
Copper	0.79(1)	0.14	0.10	0.064	0.070	0.18	0.41(1)	0.012	0.080	0.045
Lead	1.3(1)	0.65	0.90	0.28	0.40	0.75	0.7(1)	0.01	0.10	0.095
Mercury - Inorganic	0.076(1)	0.5	0.20	0.059	0.10	0.64	0.023(1)	0.032	0.0009	0.0011
Mercury - Organic	1.0(1)	0.039	0.30	0.16	0.10	0.032	0.63(1)	0.015	0.30	0.094
Nickel	0.011	0.027	NA	0.0064	0.013	0.033	0.0030	0.0017	NA	0.0013
Selenium	0.37	0.82	0.41	0.57	ND	0.64	NA	0.31	NA	0.27
Silver	0.008	0.00056	0.0014	0.000083	0.012	0.00073	0.0008	0.000052	0.009	0.00083
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	0.014	0.031
Zinc	1.2(1)	0.37	0.90	0.93	0.40	0.38	0.67(1)	0.11	0.060	0.054

Notes:
NA: not assessed because TRV unavailable.
ND: no data.
(1) From 2003 EcoRA. All other ERs are from the 2007 EcoRA.

7.0 MODEL PRECISION AND PERFORMANCE

The EcoRA model can be evaluated for its precision for risk assessment purposes, but requires empirical data to determine the accuracy. Table 18 presents how repeated runs of the Monte Carlo simulation (*i.e.*, 10,000 iterations each) produced very similar results at the 95th percentile ER value for the belted kingfisher. This indicates that the EcoRA model is:

- Robust,
- Reproducible, and
- Samples each assumption sufficiently to capture the full range of possible outcomes.

Accuracy is not so easily judged without empirical data regarding current exposures in the study area, or some other validation data set. Under these circumstances, a probabilistic exposure model was used that incorporated site-specific information and enabled the estimation of the range of possible PCOC exposures for wildlife receptors linked to the aquatic environment. Comparison of the repeated ER values at the 95th percentile for the Belted Kingfisher shows little variance (Table 18) based on the relative percent difference (*i.e.*, all less than or equal to 7%). For example, the predicted copper ER value for the Belted Kingfisher in the third iteration was 0.22 (Table 18), but could range ± 6% based on the calculated relative percent difference. Therefore, the predicted ER values could range between 0.21 and 0.23 based on a precision estimate of 6%. For management purposes, this precision error is deemed acceptable; sufficient iterations of the model were selected to produce robust and reproducible ER values. Therefore, the model results presented in Table 13 to Table 15 are judged to be acceptable for risk assessment and risk management purposes with less than 10% variability.

Table 18 Predicted 95th Percentile ER Value for the Belted Kingfisher for Three Repeated Model Runs

PCOC	***Model Run (i.e., 10,000 iterations)***			***RPD[(1)] Min to Max [%]***
	#1	***#2***	***#3***	
Arsenic	0.14	0.14	0.15	-4 to 3
Cadmium	0.20	0.19	0.19	-2 to 3
Chromium	0.53	0.52	0.53	-2 to 1
Cobalt	0.11	0.11	0.12	-7 to 4
Copper	0.23	0.22	0.22	-6 to 6
Lead	1.0	1.0	0.99	-3 to 4
Mercury (Inorganic)	0.72	0.72	0.73	-1 to 1
Mercury (Organic)	0.049	0.049	0.050	-1 to 1
Nickel	0.041	0.041	0.041	-1 to 2
Selenium	0.90	0.091	0.091	-1 to 1
Silver	0.00080	0.00080	0.00078	-2 to 2
Thallium	NA	NA	NA	NA
Zinc	0.47	0.47	0.048	-1 to 2

(1) Relative percent difference (RPD) calculated as follows {(X-Y) / [(X+Y)/2]} x 100% for the following combinations #1 to #2, #1 to #3 and #2 to #3.
Notes:
NA: not assessed because TRV unavailable.

8.0 PATHWAY CONTRIBUTION TO EXPOSURE

Pathway contribution to exposure was calculated for each PCOC and receptor to highlight the dominant pathways that are contributing to exposure and risk. Table 19 to Table 23 present the pathways of exposure contribution for the Belted Kingfisher, Great Blue Heron, Mallard, Osprey, and River Otter, respectively. In all circumstances, water ingestion contributes less than 0.2% to exposure on average. The dominant pathways of exposure are benthic invertebrate, fish and sediment ingestion, although there is no consistent pattern to the pathway contribution for each receptor and PCOC combination (*e.g.*, Belted Kingfisher exposure to organic mercury was predicted to be 38% from benthic invertebrate ingestion and 62% from fish ingestion; however, exposure to arsenic was predicted to be 94% from benthic invertebrate ingestion).

Table 19 PCOC Pathway Contribution to Exposure for the Belted Kingfisher

PCOC	***Pathway of Exposure (Mean ± Standard Deviation) [%]***			
	Benthic	***Fish***	***Sediment***	***Water***
Arsenic	94 ± 5	5 ± 5	1 ± 0.5	0 ± 0
Cadmium	90 ± 11	10 ± 11	0.2 ± 0.2	0 ± 0
Chromium	74 ± 20	3 ± 3	23 ± 18	0 ± 0
Cobalt	76 ± 16	10 ± 8	14 ± 9	0 ± 0
Copper	76 ± 17	15 ± 11	9 ± 8	0 ± 0
Lead	58 ± 30	29 ± 26	13 ± 12	0 ± 0
Mercury (Inorganic)	95 ± 3.8	5 ± 4	0.1 ± 0.1	0 ± 0
Mercury (Organic)	38 ± 20	62 ± 20	0 ± 0	0 ± 0
Nickel	83 ± 15	4 ± 7	10 ± 9	0 ± 0
Selenium	53 ± 11	47 ± 11	0.2 ± 0.1	0 ± 0
Silver	82 ± 14	8 ± 9	10 ± 9	0 ± 0
Thallium	73 ± 25	24 ± 24	2 ± 2	0 ± 0.1
Zinc	54 ± 17	40 ± 15	7 ± 4	0 ± 0

Table 20 PCOC Pathway Contribution to Exposure for the Great Blue Heron

PCOC	***Pathway of Exposure (Mean ± Standard Deviation) [%]***			
	Benthic	***Fish***	***Sediment***	***Water***
Arsenic	62 ± 19	38 ± 19	0 ± 0	0 ± 0
Cadmium	52 ± 22	49 ± 22	0 ± 0	0 ± 0.1
Chromium	67 ± 25	33 ± 25	0 ± 0	0.2 ± 0.2
Cobalt	54 ±24	55 ± 24	0 ± 0	0 ± 0
Copper	38 ±25	62 ± 25	0 ± 0	0 ± 0
Lead	31 ± 30	69 ± 30	0 ± 0	0 ± 0
Mercury (Inorganic)	63 ± 18	38 ± 18	0 ± 0	0 ± 0
Mercury (Organic)	6 ± 7	94 ± 7.3	0 ± 0	0 ± 0
Nickel	60 ± 27	42 ± 27	0 ± 0	0.1 ± 0.1
Selenium	8.3 ± 3.5	92 ± 3.5	0 ± 0	0 ± 0
Silver	55 ± 25	45 ± 25	0 ± 0	0 ± 0
Thallium	36 ± 29	64 ± 29	0 ± 0	0.1 ± 0.3
Zinc	12 ± 10	89 ± 8.9	0 ± 0	0 ± 0

Table 21 PCOC Pathway Contribution to Exposure for the Mallard

PCOC	***Pathway of Exposure (Mean ± Standard Deviation) [%]***			
	Benthic	***Fish***	***Sediment***	***Water***
Arsenic	98 ± 1	0 ± 0	1.7 ± 1.0	0 ± 0
Cadmium	100 ± 1.3	0 ± 0	0.4 ± 1.3	0 ± 0
Chromium	68 ± 23	0 ± 0	32 ± 23	0 ± 0
Cobalt	77 ± 15	0 ± 0	23 ± 15	0 ± 0
Copper	82 ± 14	0 ± 0	18 ± 15	0 ± 0
Lead	71 ± 24	0 ± 0	29 ± 24	0 ± 0
Mercury (Inorganic)	100 ± 0.2	0 ± 0	0.3 ± 0.2	0 ± 0
Mercury (Organic)	100 ± 0.1	0 ± 0	0.2 ± 0.1	0 ± 0
Nickel	83 ± 14	0 ± 0	17 ± 14	0 ± 0
Selenium	99 ± 0.5	0 ± 0	0.8 ± 0.5	0 ± 0
Silver	83 ± 14	0 ± 0	17 ± 14	0 ± 0
Thallium	94 ± 5	0 ± 0	5.7 ± 4.9	0 ± 0.1
Zinc	81 ± 10	0 ± 0	19 ± 10	0 ± 0

Table 22 PCOC Pathway Contribution to Exposure for the Osprey

PCOC	***Pathway of Exposure (Mean ± Standard Deviation) [%]***			
	Benthic	***Fish***	***Sediment***	***Water***
Arsenic	59 ± 18	36 ± 18	4.1 ± 2.3	0 ± 0
Cadmium	51 ± 22	48 ± 22	0.6 ± 0.4	0 ± 0.1
Chromium	39 ± 27	13 ± 8	48 ± 22	0.1 ± 0.1
Cobalt	34 ± 22	38 ± 16	29 ± 12	0 ± 0
Copper	32 ± 24	50 ± 20	18 ± 10	0 ± 0
Lead	25 ± 26	57 ± 28	18 ± 16	0 ± 0
Mercury (Inorganic)	62 ± 18	38 ± 18	0.6 ± 0.4	0 ± 0
Mercury (Organic)	6.2 ± 7.5	94 ± 7.5	0 ± 0	0 ± 0
Nickel	47 ± 28	30 ± 17	33 ± 13	0.1 ± 0
Selenium	8.2 ± 3.5	92 ± 3.5	0.3 ± 0.1	0 ± 0
Silver	42 ± 23	32 ± 20	26 ± 17	0 ± 0
Thallium	34 ± 29	62 ± 29	5 ± 4.5	0.1 ± 0.2
Zinc	11 ± 8.1	81 ± 9	8.1 ± 4	0 ± 0

Table 23 PCOC Pathway Contribution to Exposure for the River Otter

PCOC	Pathway of Exposure (Mean ± Standard Deviation) [%]			
	Benthic	**Fish**	**Sediment**	**Water**
Arsenic	59 ± 18	36 ± 18	4.1 ± 2.3	0.1 ± 0.1
Cadmium	51 ± 22	48 ± 22	0.6 ± 0.4	0.1 ± 0.1
Chromium	39 ± 27	13 ± 8	47 ± 22	0.2 ± 0.1
Cobalt	34 ± 22	38 ± 16	29 ± 12	0 ± 0
Copper	32 ± 24	50 ± 20	18 ± 10	0 ± 0
Lead	24 ± 26	57 ± 28	18 ± 16	0 ± 0
Mercury (Inorganic)	62 ± 18	38 ± 18	0.6 ± 0.4	0 ± 0
Mercury (Organic)	6.2 ± 7.5	94 ± 7.5	0 ± 0	0 ± 0
Nickel	48 ± 28	29 ± 17	23 ± 13	0.1 ± 0.1
Selenium	8.3 ± 3.5	91 ± 3.5	0.3 ± 0.1	0 ± 0
Silver	41 ± 27	33 ± 21	26 ± 17	0 ± 0
Thallium	34 ± 29	61 ± 29	5 ± 4.6	0.2 ± 0.6
Zinc	11 ± 8.2	81 ± 9	8 ± 4	0 ± 0

9.0 CONCLUSIONS

The current assessment evaluated risks to 12 PCOC for five wildlife species with a strong link to the aquatic environment. Risk characterization based on comparisons of exposures to TRVs was completed for each receptor and PCOC. The predicted ERs demonstrated that none of the wildlife receptors are exposed to concentrations associated with unacceptable risks (probability of predicted ER value greater than 1.0 was less than 10%). The confidence in these predicted values is adequate to rule out risks, due to the measured concentrations in fish, benthic invertebrates, sediment and surface water, particularly given the conservative assumptions used in this work. Therefore, it can be concluded that the receptors are not exposed to unacceptable concentrations of PCOC through their aquatic diets.

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APPENDIX A

PROBABILISTIC RISK MODEL

Exposure Calculations and Risk Estimates

Sample Calculation

Receptor

Belted_Kingfisher

Exposure Variables		
Variable	Value	Units
NFMR	5.02E+02	kcal/kg bw/day
SIR	0.00E+00	kg/day
WIR	1.67E-02	L/Day
BW	1.52E-01	kg-WW
SIRsed	2.52E-04	kg/day

Calculated Exposure

Parameter	Units	Arsenic	Cadmium	Chromium	Cobalt	Copper	Mercury(Inorganic)	Lead	Mercury	Mercury(Organic)	Nickel	Selenium	Silver	Thallium	Zinc
Sediment	mg/kg	9.00E+01	7.40E-01	2.50E+01	7.52E+00	2.02E+02	9.80E-02	8.00E+01	1.00E-01	2.00E-03	1.10E+01	6.30E-01	1.47E+00	1.70E-01	1.27E+03
Water(Total)	mg/L	3.00E-04	6.40E-05	9.60E-04	1.40E-05	3.70E-04	6.75E-05	1.50E-04	7.50E-05	7.50E-06	3.00E-04	3.00E-04	5.00E-06	3.10E-05	2.20E-03
Aquatic	mg/kg wet weight	2.52E+00	4.77E+00	3.29E+00	1.00E+00	1.78E+01	4.10E-02	4.80E+01	6.40E-02	2.30E-02	3.10E+00	3.90E-01	4.80E-01	7.80E-02	1.11E+02
Benthic	mg/kg wet weight	1.20E+00	1.00E+00	1.10E+00	3.90E-01	1.10E+01	2.80E-02	9.80E+00	4.00E-02	1.20E-02	1.30E+00	5.00E-01	9.00E-02	8.00E-02	5.20E+01
Fish	mg/kg dry weight	2.50E-01	5.00E-02	1.00E-01	4.00E-02	1.30E+00	1.60E-02	1.70E-01	3.20E-01	3.04E-01	5.00E-02	1.80E+00	3.00E-02	5.00E-02	4.50E+01
Media-specific Estimated Daily Intake															
Aquatic	mg/kg/day	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Benthic	mg/kg/day	5.46E-01	3.19E-01	5.01E-01	1.78E-01	3.50E+00	1.27E-02	1.34E+00	1.82E-02	5.46E-03	5.92E-01	2.28E-01	4.10E-02	3.64E-02	1.42E+01
Fish	mg/kg/day	2.25E-02	4.49E-03	8.98E-03	3.59E-03	1.17E-01	1.44E-03	1.53E-02	2.87E-02	2.73E-02	4.49E-03	1.62E-01	2.69E-03	4.49E-03	4.04E+00
Exposure Modifying Factors															
$BA_{AquaInvrt}$	%	100%	70%	100%	100%	70%	100%	30%	100%	100%	100%	100%	100%	100%	60%
BA_{sed}	%	50%	33%	100%	100%	40%	5%	50%	100%	100%	100%	100%	100%	100%	50%
Estimated Daily Intake															
EDI_{Food}	mg/kg/day	5.69E-01	3.23E-01	5.10E-01	1.81E-01	3.62E+00	1.42E-02	1.35E+00	4.70E-02	3.28E-02	5.96E-01	3.89E-01	4.37E-02	4.09E-02	1.82E+01
EDI_{Sed}	mg/kg/day	7.46E-02	4.05E-04	4.15E-02	1.25E-02	1.34E-01	8.13E-06	6.63E-02	1.66E-04	3.32E-06	1.82E-02	1.04E-03	2.44E-03	2.82E-04	1.06E+00
EDI_{Water}	mg/kg/day	3.30E-05	7.03E-06	1.06E-04	1.54E-06	4.07E-05	7.42E-06	1.65E-05	8.24E-06	8.24E-07	3.30E-05	3.30E-05	5.50E-07	3.41E-06	2.42E-04
EDI_{Total}	mg/kg/day	6.43E-01	3.23E-01	5.51E-01	1.94E-01	3.76E+00	1.42E-02	1.42E+00	4.71E-02	3.28E-02	6.14E-01	3.90E-01	4.61E-02	4.12E-02	1.93E+01
Hazard Assessment															
EL	mg/kg/day	1.40E+01	4.40E+00	5.00E+00	7.80E+00	7.20E+01	9.00E-02	9.90E+00	na	7.70E-01	7.70E+01	8.00E-01	2.00E+02	na	1.30E+02
ER	Unitless	4.59E-02	7.35E-02	1.10E-01	2.48E-02	5.22E-02	1.58E-01	1.43E-01	na	4.26E-02	7.98E-03	4.88E-01	2.30E-04	1.00E-06	1.48E-01

Pathway Analysis [% of Media Contributing to External Dose]

Media	Diet Apportionment	Arsenic	Cadmium	Chromium	Cobalt	Copper	Mercury(Inorganic)	Lead	Mercury	Mercury(Organic)	Nickel	Selenium	Silver	Thallium	Zinc
Dietary Pathway															
Aquatic	0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Benthic	42%	84.9%	98.5%	90.8%	91.7%	93.3%	89.8%	94.3%	38.6%	16.7%	96.3%	58.3%	88.9%	88.4%	73.6%
Fish	58%	3.5%	1.4%	1.6%	1.9%	3.1%	10.1%	1.1%	61.0%	83.3%	0.7%	41.4%	5.8%	10.9%	20.9%
Diet Total	100%	88%	100%	92%	94%	96%	100%	95%	100%	100%	97%	100%	95%	99%	95%
Other Pathways															
Sediment		11.6%	0.1%	7.5%	6.4%	3.6%	0.1%	4.7%	0.4%	0.0%	3.0%	0.3%	5.3%	0.7%	5.5%
Water		0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Exposure Limits

Table A-1. Wildlife Oral Toxicity TRVs

Wildlife Receptor	Chemical	Abbreviation	TRV [mg/kg/day]
Belted_Kingfisher	Arsenic	Belted_Kingfisher_Arsenic	14
Great_Blue_Heron	Arsenic	Great_Blue_Heron_Arsenic	4.2
Mallard	Arsenic	Mallard_Arsenic	14
Osprey	Arsenic	Osprey_Arsenic	14
River_Otter	Arsenic	River_Otter_Arsenic	0.2
Belted_Kingfisher	Cadmium	Belted_Kingfisher_Cadmium	4.4
Great_Blue_Heron	Cadmium	Great_Blue_Heron_Cadmium	0.4
Mallard	Cadmium	Mallard_Cadmium	4.4
Osprey	Cadmium	Osprey_Cadmium	4.4
River_Otter	Cadmium	River_Otter_Cadmium	1.7
Belted_Kingfisher	Chromium	Belted_Kingfisher_Chromium	5
Great_Blue_Heron	Chromium	Great_Blue_Heron_Chromium	1
Mallard	Chromium	Mallard_Chromium	5
Osprey	Chromium	Osprey_Chromium	5
River_Otter	Chromium	River_Otter_Chromium	13
Belted_Kingfisher	Cobalt	Belted_Kingfisher_Cobalt	7.8
Great_Blue_Heron	Cobalt	Great_Blue_Heron_Cobalt	4.1
Mallard	Cobalt	Mallard_Cobalt	7.8
Osprey	Cobalt	Osprey_Cobalt	7.8
River_Otter	Cobalt	River_Otter_Cobalt	11
Belted_Kingfisher	Copper	Belted_Kingfisher_Copper	72
Great_Blue_Heron	Copper	Great_Blue_Heron_Copper	11
Mallard	Copper	Mallard_Copper	72
Osprey	Copper	Osprey_Copper	72
River_Otter	Copper	River_Otter_Copper	15
Belted_Kingfisher	Lead	Belted_Kingfisher_Lead	9.9
Great_Blue_Heron	Lead	Great_Blue_Heron_Lead	3
Mallard	Lead	Mallard_Lead	9.9
Osprey	Lead	Osprey_Lead	9.9
River_Otter	Lead	River_Otter_Lead	8
Belted_Kingfisher	Mercury	Belted_Kingfisher_Mercury	na
Great_Blue_Heron	Mercury	Great_Blue_Heron_Mercury	na
Mallard	Mercury	Mallard_Mercury	na
Osprey	Mercury	Osprey_Mercury	na
River_Otter	Mercury	River_Otter_Mercury	na
Belted_Kingfisher	Mercury(Inorganic)	Belted_Kingfisher_Mercury(Inorganic)	0.09
Great_Blue_Heron	Mercury(Inorganic)	Great_Blue_Heron_Mercury(Inorganic)	0.045
Mallard	Mercury(Inorganic)	Mallard_Mercury(Inorganic)	0.09
Osprey	Mercury(Inorganic)	Osprey_Mercury(Inorganic)	0.09
River_Otter	Mercury(Inorganic)	River_Otter_Mercury(Inorganic)	2
Belted_Kingfisher	Mercury(Organic)	Belted_Kingfisher_Mercury(Organic)	0.77
Great_Blue_Heron	Mercury(Organic)	Great_Blue_Heron_Mercury(Organic)	0.068
Mallard	Mercury(Organic)	Mallard_Mercury(Organic)	0.77
Osprey	Mercury(Organic)	Osprey_Mercury(Organic)	0.77
River_Otter	Mercury(Organic)	River_Otter_Mercury(Organic)	0.1
Belted_Kingfisher	Nickel	Belted_Kingfisher_Nickel	77
Great_Blue_Heron	Nickel	Great_Blue_Heron_Nickel	18
Mallard	Nickel	Mallard_Nickel	77
Osprey	Nickel	Osprey_Nickel	77

Table A-1. Wildlife Oral Toxicity TRVs

Wildlife Receptor	Chemical	Abbreviation	TRV [mg/kg/day]
River_Otter	Nickel	River_Otter_Nickel	80
Belted_Kingfisher	Selenium	Belted_Kingfisher_Selenium	0.8
Great_Blue_Heron	Selenium	Great_Blue_Heron_Selenium	0.4
Mallard	Selenium	Mallard_Selenium	0.8
Osprey	Selenium	Osprey_Selenium	0.8
River_Otter	Selenium	River_Otter_Selenium	0.76
Belted_Kingfisher	Silver	Belted_Kingfisher_Silver	200
Great_Blue_Heron	Silver	Great_Blue_Heron_Silver	100
Mallard	Silver	Mallard_Silver	200
Osprey	Silver	Osprey_Silver	200
River_Otter	Silver	River_Otter_Silver	10
Belted_Kingfisher	Thallium	Belted_Kingfisher_Thallium	na
Great_Blue_Heron	Thallium	Great_Blue_Heron_Thallium	na
Mallard	Thallium	Mallard_Thallium	na
Osprey	Thallium	Osprey_Thallium	na
River_Otter	Thallium	River_Otter_Thallium	0.7
Belted_Kingfisher	Zinc	Belted_Kingfisher_Zinc	130
Great_Blue_Heron	Zinc	Great_Blue_Heron_Zinc	13
Mallard	Zinc	Mallard_Zinc	130
Osprey	Zinc	Osprey_Zinc	130
River_Otter	Zinc	River_Otter_Zinc	210

Notes:
TRV: Toxicity reference values
na: indicates not available

Physical and
Chemical Properties

Table A-2. Food Water Content [FWC]

Food Type	Value[%]	Reference
Aquatic	87.0%	US EPA 1993
Benthic	83.3%	Pietz et al. 1984 cited in Table C-6 in US EPA 1999
Fish	75.0%	US EPA 1993

Table A-3. Portion of Methyl vs. Inorganic Mercury in Biota [%]

Media	MeHg	Hg	Reference/Comment
Aquatic	36.0%	64.0%	Assumed similar to herb or grass
Benthic	30.0%	70.0%	Watras and Bloom 1992; cited in Morel et al. 1998
Fish	95.0%	5.0%	Watras and Bloom 1992; cited in Morel et al. 1998

Exposure Variables

Sample Calculation of Soil and Sediment Ingestion Rates

Receptor		**Percent Soil in Diet**
Belted_Kingfisher		0.0%
NFMR		**Percent Sediment in Diet**
5.02E+02	kcal/kg/day	1.0%
7.62E+01	kcal/day	
7.62E+04	cal/day	
BW		
1.52E-01	kg	

	Estimation of Average Metabolizable Energy			**EPA Method**	**CEI Method**
Diet	Portion	GE [kcal/kg-DW]	AE [%]	MEavg kcal/kg-DW	FIR kg/day
Aquatic	0%	4600	23%	0.E+00	0.00E+00
Shrub	0%	4200	47%	0.E+00	0.00E+00
Grass	0%	4300	47%	0.E+00	0.00E+00
Herb	0%	4200	47%	0.E+00	0.00E+00
Seeds	0%	5100	59%	0.E+00	0.00E+00
Detritus	0%	4300	47%	0.E+00	0.00E+00
Flying	0%	5400	75%	0.E+00	0.00E+00
Root	0%	4700	56%	0.E+00	0.00E+00
Berries	0%	2200	64%	0.E+00	0.00E+00
Conifer	0%	4300	34%	0.E+00	0.00E+00
Lichen	0%	4300	47%	0.E+00	0.00E+00
Worm	0%	4600	72%	0.E+00	0.00E+00
Insect	0%	5800	75%	0.E+00	0.00E+00
Benthic	42%	3600	77%	1.E+03	1.15E-02
Amphibian	0%	4600	79%	0.E+00	0.00E+00
Mammal	0%	5000	78%	0.E+00	0.00E+00
Fish	58%	4100	79%	2.E+03	1.36E-02
			Sum	**3.04E+03**	**2.52E-02**

	EPA Method	CEI Method
Estimation of Total Normalized Ingestion Rate [NIR_{total}]	2.50E-02	2.52E-02
Soil Ingestion Rate [SIR]	0.00E+00	0.00E+00
Sediment Ingestion Rate [SIRsed]	2.50E-04	2.52E-04
Estimation of Total Ingestion Rate [kg-food / kg-BW day]	1.65E-01	1.66E-01

Table A-4. Receptor Exposure Variables

Receptor	Variable	Value	Distribution	Average	StDev	Units	Reference/Comments
Belted_Kingfisher	BW	1.52E-01	N(0.152,0.0156)	1.52E-01	1.56E-02	kg-WW	Pennsylvania and Ohio area were used; 3 means were used (adults) (US EPA 1993).
Great_Blue_Heron	BW	2.34E+00	LN(2.34,0.762)	2.34E+00	7.62E-01	kg-WW	The mean of three values were used. For the distribution, selected the higest StDev; 3 means were used (adults) (US EPA 1993).
Mallard	BW	1.13E+00	LN(1.082,0.129)	1.08E+00	1.29E-01	kg-WW	Dunning, 1984
Osprey	BW	1.57E+00	N(1.6, 0.02)	1.60E+00	2.00E-02	kg-WW	The mean of 9 values was used (US EPA 1993); for the distribution the mean of 7 values was used (adults).
River_Otter	BW	7.34E+00	LN(8.6, 1.15)	8.60E+00	1.15E+00	kg-WW	US EPA 1993; The mean of 4 values were used (adults)
Belted_Kingfisher	FIR	1.71E-02				kg-DW/day	US EPA 1993; all birds allometric avian equation used
Great_Blue_Heron	FIR	1.01E-01				kg-DW/day	US EPA 1993; all birds allometric avian equation used
Mallard	FIR	6.29E-02				kg-DW/day	US EPA 1993; allometric avian equation used
Osprey	FIR	7.80E-02				kg-DW/day	US EPA 1993; all birds allometric avian equation used
River_Otter	FIR	3.54E-01				kg-DW/day	US EPA 1993: allometric mammalian equation
Belted_Kingfisher	SIR	0.0%				% of Diet	Assumed sediment
Great_Blue_Heron	SIR	0.0%				% of Diet	Assumed negligible based on green heron with similar diet; Sample et al. 1997
Mallard	SIR	0.0%				% of Diet	Assumed sediment
Osprey	SIR	0.0%				% of Diet	Assumed negligible based on green heron with similar diet; Sample et al. 1997
River_Otter	SIR	0.0%				% of Diet	Assumed
Belted_Kingfisher	SIRsed	1.0%				% of Diet	Difficult to determine, assumed 1%
Great_Blue_Heron	SIRsed	0.0%				% of Diet	
Mallard	SIRsed	3.3%				% of Diet	Suter et al 2000
Osprey	SIRsed	1.0%				% of Diet	Difficult to determine, assumed 1%
River_Otter	SIRsed	1.0%				% of Diet	Difficult to determine, assumed 1%
Belted_Kingfisher	WIR	1.67E-02				L/day	US EPA 1993; allometric avian equation used
Great_Blue_Heron	WIR	1.04E-01				L/day	US EPA 1993; allometric avian equation used
Mallard	WIR	6.39E-02				L/day	US EPA 1993; allometric avian equation used
Osprey	WIR	7.98E-02				L/day	US EPA 1993; allometric avian equation used
River_Otter	WIR	5.95E-01				L/day	US EPA 1993: allometric mammalian equation

Table A-5. Receptor Dietary Composition [Media % of Diet]

Receptor	Media	Abbreviation	Value
Belted_Kingfisher	Aquatic	Belted_Kingfisher_Aquatic	0%
Belted_Kingfisher	Amphibian	Belted_Kingfisher_Amphibian	0%
Belted_Kingfisher	Benthic	Belted_Kingfisher_Benthic	42%
Belted_Kingfisher	Berries	Belted_Kingfisher_Berries	0%
Belted_Kingfisher	Conifer	Belted_Kingfisher_Conifer	0%
Belted_Kingfisher	Detritus	Belted_Kingfisher_Detritus	0%
Belted_Kingfisher	Fish	Belted_Kingfisher_Fish	58%
Belted_Kingfisher	Flying	Belted_Kingfisher_Flying	0%
Belted_Kingfisher	Grass	Belted_Kingfisher_Grass	0%
Belted_Kingfisher	Herb	Belted_Kingfisher_Herb	0%
Belted_Kingfisher	Insect	Belted_Kingfisher_Insect	0%
Belted_Kingfisher	Lichen	Belted_Kingfisher_Lichen	0%
Belted_Kingfisher	Mammal	Belted_Kingfisher_Mammal	0%
Belted_Kingfisher	Root	Belted_Kingfisher_Root	0%
Belted_Kingfisher	Seeds	Belted_Kingfisher_Seeds	0%
Belted_Kingfisher	Shrub	Belted_Kingfisher_Shrub	0%
Belted_Kingfisher	Worm	Belted_Kingfisher_Worm	0%
Great_Blue_Heron	Aquatic	Great_Blue_Heron_Aquatic	0%
Great_Blue_Heron	Amphibian	Great_Blue_Heron_Amphibian	0%
Great_Blue_Heron	Benthic	Great_Blue_Heron_Benthic	5%
Great_Blue_Heron	Berries	Great_Blue_Heron_Berries	0%
Great_Blue_Heron	Conifer	Great_Blue_Heron_Conifer	0%
Great_Blue_Heron	Detritus	Great_Blue_Heron_Detritus	0%
Great_Blue_Heron	Fish	Great_Blue_Heron_Fish	95%
Great_Blue_Heron	Flying	Great_Blue_Heron_Flying	0%
Great_Blue_Heron	Grass	Great_Blue_Heron_Grass	0%
Great_Blue_Heron	Herb	Great_Blue_Heron_Herb	0%
Great_Blue_Heron	Insect	Great_Blue_Heron_Insect	0%
Great_Blue_Heron	Lichen	Great_Blue_Heron_Lichen	0%
Great_Blue_Heron	Mammal	Great_Blue_Heron_Mammal	0%
Great_Blue_Heron	Root	Great_Blue_Heron_Root	0%
Great_Blue_Heron	Seeds	Great_Blue_Heron_Seeds	0%
Great_Blue_Heron	Shrub	Great_Blue_Heron_Shrub	0%
Great_Blue_Heron	Worm	Great_Blue_Heron_Worm	0%
Mallard	Amphibian	Mallard_Amphibian	0%
Mallard	Aquatic	Mallard_Aquatic	0%
Mallard	Benthic	Mallard_Benthic	100%
Mallard	Berries	Mallard_Berries	0%
Mallard	Conifer	Mallard_Conifer	0%
Mallard	Detritus	Mallard_Detritus	0%
Mallard	Fish	Mallard_Fish	0%
Mallard	Flying	Mallard_Flying	0%
Mallard	Grass	Mallard_Grass	0%
Mallard	Herb	Mallard_Herb	0%
Mallard	Insect	Mallard_Insect	0%
Mallard	Lichen	Mallard_Lichen	0%
Mallard	Mammal	Mallard_Mammal	0%
Mallard	Root	Mallard_Root	0%
Mallard	Seeds	Mallard_Seeds	0%
Mallard	Shrub	Mallard_Shrub	0%

Table A-5. Receptor Dietary Composition [Media % of Diet]

Receptor	Media	Abbreviation	Value
Mallard	Worm	Mallard_Worm	0%
Osprey	Amphibian	Osprey_Amphibian	0%
Osprey	Aquatic	Osprey_Aquatic	0%
Osprey	Benthic	Osprey_Benthic	5%
Osprey	Berries	Osprey_Berries	0%
Osprey	Conifer	Osprey_Conifer	0%
Osprey	Detritus	Osprey_Detritus	0%
Osprey	Fish	Osprey_Fish	95%
Osprey	Flying	Osprey_Flying	0%
Osprey	Grass	Osprey_Grass	0%
Osprey	Herb	Osprey_Herb	0%
Osprey	Insect	Osprey_Insect	0%
Osprey	Lichen	Osprey_Lichen	0%
Osprey	Mammal	Osprey_Mammal	0%
Osprey	Root	Osprey_Root	0%
Osprey	Seeds	Osprey_Seeds	0%
Osprey	Shrub	Osprey_Shrub	0%
Osprey	Worm	Osprey_Worm	0%
River_Otter	Amphibian	River_Otter_Amphibian	0%
River_Otter	Aquatic	River_Otter_Aquatic	0%
River_Otter	Benthic	River_Otter_Benthic	5%
River_Otter	Berries	River_Otter_Berries	0%
River_Otter	Conifer	River_Otter_Conifer	0%
River_Otter	Detritus	River_Otter_Detritus	0%
River_Otter	Fish	River_Otter_Fish	95%
River_Otter	Flying	River_Otter_Flying	0%
River_Otter	Grass	River_Otter_Grass	0%
River_Otter	Herb	River_Otter_Herb	0%
River_Otter	Insect	River_Otter_Insect	0%
River_Otter	Lichen	River_Otter_Lichen	0%
River_Otter	Mammal	River_Otter_Mammal	0%
River_Otter	Root	River_Otter_Root	0%
River_Otter	Seeds	River_Otter_Seeds	0%
River_Otter	Shrub	River_Otter_Shrub	0%
River_Otter	Worm	River_Otter_Worm	0%

Table A-6. Normalized to Body Weight Free-living (Field) Metabolic Rate (NFMR)

Receptor	Value	Slope			Power			Reference/Comments
Belted_Kingfisher	5.02E+02	1.02E+00	1.02E+00	4.00E-02	6.80E-01	6.80E-01	2.00E-02	US EPA 1993; Estimate based on passerines
Great_Blue_Heron	2.09E+02	1.02E+00	1.02E+00	4.00E-02	6.80E-01	6.80E-01	2.00E-02	US EPA 1993; Estimate based on passerines
Mallard	2.64E+02	1.02E+00	1.02E+00	4.00E-02	6.80E-01	6.80E-01	2.00E-02	US EPA 1993; Estimate based on passerines
Osprey	2.38E+02	1.02E+00	1.02E+00	4.00E-02	6.80E-01	6.80E-01	2.00E-02	US EPA 1993; Estimate based on passerines
River_Otter	1.81E+02	4.12E-01	4.12E-01	5.80E-02	8.62E-01	8.62E-01	2.60E-02	US EPA 1993; Estimate based on non-herbivores

Table A-7. Metabolizable Energy (ME) of Dietary Items [kcal/kg]

Receptor	Dietary Item	Abbreviation	Value	Reference/Comments
Belted_Kingfisher	Amphibian	Belted_Kingfisher_Amphibian	3634	US EPA 1993; Equation 4-17
Belted_Kingfisher	Aquatic	Belted_Kingfisher_Aquatic	1058	US EPA 1993; Equation 4-17
Belted_Kingfisher	Benthic	Belted_Kingfisher_Benthic	2772	US EPA 1993; Equation 4-17
Belted_Kingfisher	Berries	Belted_Kingfisher_Berries	1408	US EPA 1993; Equation 4-17
Belted_Kingfisher	Conifer	Belted_Kingfisher_Conifer	1462	US EPA 1993; Equation 4-17
Belted_Kingfisher	Detritus	Belted_Kingfisher_Detritus	2021	US EPA 1993; Equation 4-17
Belted_Kingfisher	Fish	Belted_Kingfisher_Fish	3239	US EPA 1993; Equation 4-17
Belted_Kingfisher	Flying	Belted_Kingfisher_Flying	4050	US EPA 1993; Equation 4-17
Belted_Kingfisher	Grass	Belted_Kingfisher_Grass	2021	US EPA 1993; Equation 4-17
Belted_Kingfisher	Herb	Belted_Kingfisher_Herb	1974	US EPA 1993; Equation 4-17
Belted_Kingfisher	Insect	Belted_Kingfisher_Insect	4350	US EPA 1993; Equation 4-17
Belted_Kingfisher	Lichen	Belted_Kingfisher_Lichen	2021	US EPA 1993; Equation 4-17
Belted_Kingfisher	Mammal	Belted_Kingfisher_Mammal	3900	US EPA 1993; Equation 4-17
Belted_Kingfisher	Root	Belted_Kingfisher_Root	2632	US EPA 1993; Equation 4-17
Belted_Kingfisher	Seeds	Belted_Kingfisher_Seeds	3009	US EPA 1993; Equation 4-17
Belted_Kingfisher	Shrub	Belted_Kingfisher_Shrub	1974	US EPA 1993; Equation 4-17
Belted_Kingfisher	Worm	Belted_Kingfisher_Worm	3312	US EPA 1993; Equation 4-17
Great_Blue_Heron	Amphibian	Great_Blue_Heron_Amphibian	3634	US EPA 1993; Equation 4-17
Great_Blue_Heron	Aquatic	Great_Blue_Heron_Aquatic	1058	US EPA 1993; Equation 4-17
Great_Blue_Heron	Benthic	Great_Blue_Heron_Benthic	2772	US EPA 1993; Equation 4-17
Great_Blue_Heron	Berries	Great_Blue_Heron_Berries	1408	US EPA 1993; Equation 4-17
Great_Blue_Heron	Conifer	Great_Blue_Heron_Conifer	1462	US EPA 1993; Equation 4-17
Great_Blue_Heron	Detritus	Great_Blue_Heron_Detritus	2021	US EPA 1993; Equation 4-17
Great_Blue_Heron	Fish	Great_Blue_Heron_Fish	3239	US EPA 1993; Equation 4-17
Great_Blue_Heron	Flying	Great_Blue_Heron_Flying	4050	US EPA 1993; Equation 4-17
Great_Blue_Heron	Grass	Great_Blue_Heron_Grass	2021	US EPA 1993; Equation 4-17
Great_Blue_Heron	Herb	Great_Blue_Heron_Herb	1974	US EPA 1993; Equation 4-17
Great_Blue_Heron	Insect	Great_Blue_Heron_Insect	4350	US EPA 1993; Equation 4-17
Great_Blue_Heron	Lichen	Great_Blue_Heron_Lichen	2021	US EPA 1993; Equation 4-17
Great_Blue_Heron	Mammal	Great_Blue_Heron_Mammal	3900	US EPA 1993; Equation 4-17
Great_Blue_Heron	Root	Great_Blue_Heron_Root	2632	US EPA 1993; Equation 4-17
Great_Blue_Heron	Seeds	Great_Blue_Heron_Seeds	3825	US EPA 1993; Equation 4-17
Great_Blue_Heron	Shrub	Great_Blue_Heron_Shrub	1974	US EPA 1993; Equation 4-17
Great_Blue_Heron	Worm	Great_Blue_Heron_Worm	3312	US EPA 1993; Equation 4-17
Mallard	Amphibian	Mallard_Amphibian	3634	US EPA 1993; Equation 4-17
Mallard	Aquatic	Mallard_Aquatic	1058	US EPA 1993; Equation 4-17
Mallard	Benthic	Mallard_Benthic	2772	US EPA 1993; Equation 4-17
Mallard	Berries	Mallard_Berries	1408	US EPA 1993; Equation 4-17
Mallard	Conifer	Mallard_Conifer	1462	US EPA 1993; Equation 4-17
Mallard	Detritus	Mallard_Detritus	2021	US EPA 1993; Equation 4-17
Mallard	Fish	Mallard_Fish	3239	US EPA 1993; Equation 4-17
Mallard	Flying	Mallard_Flying	4050	US EPA 1993; Equation 4-17
Mallard	Grass	Mallard_Grass	989	US EPA 1993; Equation 4-17
Mallard	Herb	Mallard_Herb	966	US EPA 1993; Equation 4-17
Mallard	Insect	Mallard_Insect	4350	US EPA 1993; Equation 4-17
Mallard	Lichen	Mallard_Lichen	2021	US EPA 1993; Equation 4-17
Mallard	Mammal	Mallard_Mammal	3900	US EPA 1993; Equation 4-17
Mallard	Root	Mallard_Root	2632	US EPA 1993; Equation 4-17
Mallard	Seeds	Mallard_Seeds	3825	US EPA 1993; Equation 4-17
Mallard	Shrub	Mallard_Shrub	1974	US EPA 1993; Equation 4-17
Mallard	Worm	Mallard_Worm	3312	US EPA 1993; Equation 4-17

Table A-7. Metabolizable Energy (ME) of Dietary Items [kcal/kg]

Receptor	Dietary Item	Abbreviation	Value	Reference/Comments
Osprey	Amphibian	Osprey_Amphibian	3634	US EPA 1993; Equation 4-17
Osprey	Aquatic	Osprey_Aquatic	1058	US EPA 1993; Equation 4-17
Osprey	Benthic	Osprey_Benthic	2772	US EPA 1993; Equation 4-17
Osprey	Berries	Osprey_Berries	1408	US EPA 1993; Equation 4-17
Osprey	Conifer	Osprey_Conifer	1462	US EPA 1993; Equation 4-17
Osprey	Detritus	Osprey_Detritus	2021	US EPA 1993; Equation 4-17
Osprey	Fish	Osprey_Fish	3239	US EPA 1993; Equation 4-17
Osprey	Flying	Osprey_Flying	4698	US EPA 1993; Equation 4-17
Osprey	Grass	Osprey_Grass	1763	US EPA 1993; Equation 4-17
Osprey	Herb	Osprey_Herb	3066	US EPA 1993; Equation 4-17
Osprey	Insect	Osprey_Insect	5046	US EPA 1993; Equation 4-17
Osprey	Lichen	Osprey_Lichen	2021	US EPA 1993; Equation 4-17
Osprey	Mammal	Osprey_Mammal	4200	US EPA 1993; Equation 4-17
Osprey	Root	Osprey_Root	2632	US EPA 1993; Equation 4-17
Osprey	Seeds	Osprey_Seeds	4335	US EPA 1993; Equation 4-17
Osprey	Shrub	Osprey_Shrub	3192	US EPA 1993; Equation 4-17
Osprey	Worm	Osprey_Worm	3312	US EPA 1993; Equation 4-17
River_Otter	Amphibian	River_Otter_Amphibian	3634	US EPA 1993; Equation 4-17
River_Otter	Aquatic	River_Otter_Aquatic	1058	US EPA 1993; Equation 4-17
River_Otter	Benthic	River_Otter_Benthic	2772	US EPA 1993; Equation 4-17
River_Otter	Berries	River_Otter_Berries	1408	US EPA 1993; Equation 4-17
River_Otter	Conifer	River_Otter_Conifer	1462	US EPA 1993; Equation 4-17
River_Otter	Detritus	River_Otter_Detritus	2021	US EPA 1993; Equation 4-17
River_Otter	Fish	River_Otter_Fish	3239	US EPA 1993; Equation 4-17
River_Otter	Flying	River_Otter_Flying	4698	US EPA 1993; Equation 4-17
River_Otter	Grass	River_Otter_Grass	1763	US EPA 1993; Equation 4-17
River_Otter	Herb	River_Otter_Herb	3066	US EPA 1993; Equation 4-17
River_Otter	Insect	River_Otter_Insect	5046	US EPA 1993; Equation 4-17
River_Otter	Lichen	River_Otter_Lichen	2021	US EPA 1993; Equation 4-17
River_Otter	Mammal	River_Otter_Mammal	4200	US EPA 1993; Equation 4-17
River_Otter	Root	River_Otter_Root	2632	US EPA 1993; Equation 4-17
River_Otter	Seeds	River_Otter_Seeds	4335	US EPA 1993; Equation 4-17
River_Otter	Shrub	River_Otter_Shrub	3192	US EPA 1993; Equation 4-17
River_Otter	Worm	River_Otter_Worm	3312	US EPA 1993; Equation 4-17

Table A-8. Gross Energy (GE) of Dietary Items [kcal/kg dw]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
Belted_Kingfisher	Amphibian	4.6	N	4.6	0.45	US EPA 1993; Terrestrial amphibians (frogs, toads); mean of 3 studies
Belted_Kingfisher	Aquatic	4.6	N	4	0.31	US EPA 1993; aquatic macrophytes; mean of 12 studies
Belted_Kingfisher	Benthic	3.6	N	3.6	0.78	US EPA 1993; Aquatic invertebrates (isopods, amphipods); mean of 3 studies
Belted_Kingfisher	Berries	2.2	LN	2.2	1.6	US EPA 1993; Terestrial fruit (pulp, skin, seeds); mean of 10 studies
Belted_Kingfisher	Conifer	4.3	N	4.3	0.34	US EPA 1993; Terrestrial dicots stems, branches (mean of 51 studies)
Belted_Kingfisher	Detritus	4.3	N	4.3	0.33	Assumed equal to grass
Belted_Kingfisher	Fish	4.1	N	4.1	0.47	US EPA 1993; Aquatic vertebrates (small fish); mean of 3 studies
Belted_Kingfisher	Flying	5.4	N	5.4	0.16	US EPA 1993; Terrestrial invertebrates (grasshoppers, crickets); mean of 4 studies
Belted_Kingfisher	Grass	4.3	N	4.3	0.33	US EPA 1993; Terrestrial monocots (mature dry grasses); mean of 5 studies
Belted_Kingfisher	Herb	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Belted_Kingfisher	Insect	5.8	U	5.7	5.9	US EPA 1993; Terrestrial invertebrates (adult beetles); range reported in 3 studies
Belted_Kingfisher	Lichen	4.3	N	4.3	0.34	Assumed equal to conifer
Belted_Kingfisher	Mammal	5	N	5	1.3	US EPA 1993; Terrestrial mammals (mice, voles, rabbits); mean of 17 studies
Belted_Kingfisher	Root	4.7	N	4.7	0.43	US EPA 1993; Terrestrial dicots (roots); mean of 52 studies
Belted_Kingfisher	Seeds	5.1	N	5.1	1.1	US EPA 1993; Terrestrial dicots (seeds) mean of 57 studies
Belted_Kingfisher	Shrub	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Belted_Kingfisher	Worm	4.6	N	4.6	0.36	US EPA 1993; Terrestrial invertebrates (earthworms); mean of 4 studies
Great_Blue_Heron	Amphibian	4.6	N	4.6	0.45	US EPA 1993; Terrestrial amphibians (frogs, toads); mean of 3 studies
Great_Blue_Heron	Aquatic	4.6	N	4	0.31	US EPA 1993; aquatic macrophytes; mean of 12 studies
Great_Blue_Heron	Benthic	3.6	N	3.6	0.78	US EPA 1993; Aquatic invertebrates (isopods, amphipods); mean of 3 studies
Great_Blue_Heron	Berries	2.2	LN	2.2	1.6	US EPA 1993; Terestrial fruit (pulp, skin, seeds); mean of 10 studies
Great_Blue_Heron	Conifer	4.3	N	4.3	0.34	US EPA 1993; Terrestrial dicots stems, branches (mean of 51 studies)
Great_Blue_Heron	Detritus	4.3	N	4.3	0.33	Assumed equal to grass
Great_Blue_Heron	Fish	4.1	N	4.1	0.47	US EPA 1993; Aquatic vertebrates (small fish); mean of 3 studies
Great_Blue_Heron	Flying	5.4	N	5.4	0.16	US EPA 1993; Terrestrial invertebrates (grasshoppers, crickets); mean of 4 studies
Great_Blue_Heron	Grass	4.3	N	4.3	0.33	US EPA 1993; Terrestrial monocots (mature dry grasses); mean of 5 studies
Great_Blue_Heron	Herb	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Great_Blue_Heron	Insect	5.8	U	5.7	5.9	US EPA 1993; Terrestrial invertebrates (adult beetles); range reported in 3 studies
Great_Blue_Heron	Lichen	4.3	N	4.3	0.34	Assumed equal to conifer
Great_Blue_Heron	Mammal	5	N	5	1.3	US EPA 1993; Terrestrial mammals (mice, voles, rabbits); mean of 17 studies
Great_Blue_Heron	Root	4.7	N	4.7	0.43	US EPA 1993; Terrestrial dicots (roots); mean of 52 studies
Great_Blue_Heron	Seeds	5.1	N	5.1	1.1	US EPA 1993; Terrestrial dicots (seeds) mean of 57 studies
Great_Blue_Heron	Shrub	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Great_Blue_Heron	Worm	4.6	N	4.6	0.36	US EPA 1993; Terrestrial invertebrates (earthworms); mean of 4 studies
Mallard	Amphibian	4.6	N	4.6	0.45	US EPA 1993; Terrestrial amphibians (frogs, toads); mean of 3 studies
Mallard	Aquatic	4.6	N	4	0.31	US EPA 1993; aquatic macrophytes; mean of 12 studies
Mallard	Benthic	3.6	N	3.6	0.78	US EPA 1993; Aquatic invertebrates (isopods, amphipods); mean of 3 studies

Table A-8. Gross Energy (GE) of Dietary Items [kcal/kg dw]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
Mallard	Berries	2.2	LN	2.2	1.6	US EPA 1993; Terestrial fruit (pulp, skin, seeds); mean of 10 studies
Mallard	Conifer	4.3	N	4.3	0.34	US EPA 1993; Terrestrial dicots stems, branches (mean of 51 studies)
Mallard	Detritus	4.3	N	4.3	0.13	Assumed equal to grass
Mallard	Fish	4.1	N	4.1	0.47	US EPA 1993; Aquatic vertebrates (small fish); mean of 3 studies
Mallard	Flying	5.4	N	5.4	0.16	US EPA 1993; Terrestrial invertebrates (grasshoppers, crickets); mean of 4 studies
Mallard	Grass	4.3	N	4.3	0.13	US EPA 1993; Aquatic emergent vegetation; mean of 3 studies
Mallard	Herb	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Mallard	Insect	5.8	U	5.7	5.9	US EPA 1993; Terrestrial invertebrates (adult beetles); range reported in 3 studies
Mallard	Lichen	4.3	N	4.3	0.34	Assumed equal to conifer
Mallard	Mammal	5	N	5	1.3	US EPA 1993; Terrestrial mammals (mice, voles, rabbits); mean of 17 studies
Mallard	Root	4.7	N	4.7	0.43	US EPA 1993; Terrestrial dicots (roots); mean of 52 studies
Mallard	Seeds	5.1	N	5.1	1.1	US EPA 1993; Terrestrial dicots (seeds) mean of 57 studies
Mallard	Shrub	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Mallard	Worm	4.6	N	4.6	0.36	US EPA 1993; Terrestrial invertebrates (earthworms); mean of 4 studies
Osprey	Amphibian	4.6	N	4.6	0.45	US EPA 1993; Terrestrial amphibians (frogs, toads); mean of 3 studies
Osprey	Aquatic	4.6	N	4	0.31	US EPA 1993; aquatic macrophytes; mean of 12 studies
Osprey	Benthic	3.6	N	3.6	0.78	US EPA 1993; Aquatic invertebrates (isopods, amphipods); mean of 3 studies
Osprey	Berries	2.2	LN	2.2	1.6	US EPA 1993; Terestrial fruit (pulp, skin, seeds); mean of 10 studies
Osprey	Conifer	4.3	N	4.3	0.34	US EPA 1993; Terrestrial dicots stems, branches (mean of 51 studies)
Osprey	Detritus	4.3	N	4.3	0.33	Assumed equal to grass
Osprey	Fish	4.1	N	4.1	0.47	US EPA 1993; Aquatic vertebrates (small fish); mean of 3 studies
Osprey	Flying	5.4	N	5.4	0.16	US EPA 1993; Terrestrial invertebrates (grasshoppers, crickets); mean of 4 studies
Osprey	Grass	4.3	N	4.3	0.33	US EPA 1993; Terrestrial monocots (mature dry grasses); mean of 5 studies
Osprey	Herb	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Osprey	Insect	5.8	U	5.7	5.9	US EPA 1993; Terrestrial invertebrates (adult beetles); range reported in 3 studies
Osprey	Lichen	4.3	N	4.3	0.34	Assumed equal to conifer
Osprey	Mammal	5	N	5	1.3	US EPA 1993; Terrestrial mammals (mice, voles, rabbits); mean of 17 studies
Osprey	Root	4.7	N	4.7	0.43	US EPA 1993; Terrestrial dicots (roots); mean of 52 studies
Osprey	Seeds	5.1	N	5.1	1.1	US EPA 1993; Terrestrial dicots (seeds) mean of 57 studies
Osprey	Shrub	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
Osprey	Worm	4.6	N	4.6	0.36	US EPA 1993; Terrestrial invertebrates (earthworms); mean of 4 studies
River_Otter	Amphibian	4.6	N	4.6	0.45	US EPA 1993; Terrestrial amphibians (frogs, toads); mean of 3 studies
River_Otter	Aquatic	4.6	N	4	0.31	US EPA 1993; aquatic macrophytes; mean of 12 studies
River_Otter	Benthic	3.6	N	3.6	0.78	US EPA 1993; Aquatic invertebrates (isopods, amphipods); mean of 3 studies
River_Otter	Berries	2.2	LN	2.2	1.6	US EPA 1993; Terestrial fruit (pulp, skin, seeds); mean of 10 studies
River_Otter	Conifer	4.3	N	4.3	0.34	US EPA 1993; Terrestrial dicots stems, branches (mean of 51 studies)
River_Otter	Detritus	4.3	N	4.3	0.33	Assumed equal to grass

Table A-8. Gross Energy (GE) of Dietary Items [kcal/kg dw]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
River_Otter	Fish	4.1	N	4.1	0.47	US EPA 1993; Aquatic vertebrates (small fish); mean of 3 studies
River_Otter	Flying	5.4	N	5.4	0.16	US EPA 1993; Terrestrial invertebrates (grasshoppers, crickets); mean of 4 studies
River_Otter	Grass	4.3	N	4.3	0.33	US EPA 1993; Terrestrial monocots (mature dry grasses); mean of 5 studies
River_Otter	Herb	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
River_Otter	Insect	5.8	U	5.7	5.9	US EPA 1993; Terrestrial invertebrates (adult beetles); range reported in 3 studies
River_Otter	Lichen	4.3	N	4.3	0.34	Assumed equal to conifer
River_Otter	Mammal	5	N	5	1.3	US EPA 1993; Terrestrial mammals (mice, voles, rabbits); mean of 17 studies
River_Otter	Root	4.7	N	4.7	0.43	US EPA 1993; Terrestrial dicots (roots); mean of 52 studies
River_Otter	Seeds	5.1	N	5.1	1.1	US EPA 1993; Terrestrial dicots (seeds) mean of 57 studies
River_Otter	Shrub	4.2	N	4.2	0.49	US EPA 1993; Terrestrial dicots (leaves); mean of 57 studies
River_Otter	Worm	4.6	N	4.6	0.36	US EPA 1993; Terrestrial invertebrates (earthworms); mean of 4 studies

Table A-9. Assimilation Efficiency (AE) of Dietary Items [Percent% Efficiency]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
Belted_Kingfisher	Amphibian	79%	N	79%	5%	Assumed equal to fish diet
Belted_Kingfisher	Aquatic	23%	N	23%	5%	US EPA 1993; Ducks consuming aquatic vegetation
Belted_Kingfisher	Benthic	77%	N	77%	8%	US EPA 1993; Aquatic invertebrates (mean of 3 studies)
Belted_Kingfisher	Berries	64%	N	64%	15%	US EPA 1993; Fruit pulp, skin (mean of 31 studies)
Belted_Kingfisher	Conifer	34%	N	34%	5%	US EPA 1993; Stems, twigs, pine needles (mean of 8 studies)
Belted_Kingfisher	Detritus	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Belted_Kingfisher	Fish	79%	N	79%	5%	US EPA 1993; Fish (mean of 9 studies)
Belted_Kingfisher	Flying	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Belted_Kingfisher	Grass	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Belted_Kingfisher	Herb	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Belted_Kingfisher	Insect	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Belted_Kingfisher	Lichen	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Belted_Kingfisher	Mammal	78%	N	78%	5%	US EPA 1993; Birds, small mammals (mean of 16 studies)
Belted_Kingfisher	Root	56%	N	56%	18%	US EPA 1993; Bulbs, rhizomes (mean of 4 studies)
Belted_Kingfisher	Seeds	59%	N	59%	13%	US EPA 1993; Wild seeds specific to non-passerine birds (mean of 9 studies)
Belted_Kingfisher	Shrub	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Belted_Kingfisher	Worm	72%	N	72%	5%	US EPA 1993; "Terrestrial insects" (mean of 16 studies)
Great_Blue_Heron	Amphibian	79%	N	79%	5%	Assumed equal to fish diet
Great_Blue_Heron	Aquatic	23%	N	23%	5%	US EPA 1993; Ducks consuming aquatic vegetation
Great_Blue_Heron	Benthic	77%	N	77%	8%	US EPA 1993; Aquatic invertebrates (mean of 3 studies)
Great_Blue_Heron	Berries	64%	N	64%	15%	US EPA 1993; Fruit pulp, skin (mean of 31 studies)
Great_Blue_Heron	Conifer	34%	N	34%	5%	US EPA 1993; Stems, twigs, pine needles (mean of 8 studies)
Great_Blue_Heron	Detritus	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Great_Blue_Heron	Fish	79%	N	79%	5%	US EPA 1993; Fish (mean of 9 studies)
Great_Blue_Heron	Flying	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Great_Blue_Heron	Grass	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Great_Blue_Heron	Herb	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Great_Blue_Heron	Insect	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Great_Blue_Heron	Lichen	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Great_Blue_Heron	Mammal	78%	N	78%	5%	US EPA 1993; Birds, small mammals (mean of 16 studies)
Great_Blue_Heron	Root	56%	N	56%	18%	US EPA 1993; Bulbs, rhizomes (mean of 4 studies)
Great_Blue_Heron	Seeds	75%	N	75%	9%	US EPA 1993; Wild seeds specific to passerine birds (mean of 11 studies)
Great_Blue_Heron	Shrub	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Great_Blue_Heron	Worm	72%	N	72%	5%	US EPA 1993; "Terrestrial insects" (mean of 16 studies)
Mallard	Amphibian	79%	N	79%	5%	Assumed equal to fish diet
Mallard	Aquatic	23%	N	23%	5%	US EPA 1993; Ducks consuming aquatic vegetation
Mallard	Benthic	77%	N	77%	8%	US EPA 1993; Aquatic invertebrates (mean of 3 studies)

Table A-9. Assimilation Efficiency (AE) of Dietary Items [Percent% Efficiency]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
Mallard	Berries	64%	N	64%	15%	US EPA 1993; Fruit pulp, skin (mean of 31 studies)
Mallard	Conifer	34%	N	34%	5%	US EPA 1993; Stems, twigs, pine needles (mean of 8 studies)
Mallard	Detritus	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Mallard	Fish	79%	N	79%	5%	US EPA 1993; Fish (mean of 9 studies)
Mallard	Flying	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Mallard	Grass	23%	N	23%	5%	US EPA 1993; Aquatic vegetation specific to ducks (mean of 5 studies)
Mallard	Herb	23%	N	23%	5%	US EPA 1993; Aquatic vegetation specific to ducks (mean of 5 studies)
Mallard	Insect	75%	N	75%	5%	US EPA 1993; Terrestrial insects (mean of 16 studies)
Mallard	Lichen	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Mallard	Mammal	78%	N	78%	5%	US EPA 1993; Birds, small mammals (mean of 16 studies)
Mallard	Root	56%	N	56%	18%	US EPA 1993; Bulbs, rhizomes (mean of 4 studies)
Mallard	Seeds	75%	N	75%	9%	US EPA 1993; Wild seeds specific to passerine birds (mean of 11 studies)
Mallard	Shrub	47%	N	47%	10%	US EPA 1993; Grasses, leaves (mean of 3 studies)
Mallard	Worm	72%	N	72%	5%	US EPA 1993; "Terrestrial insects" (mean of 16 studies)
Osprey	Amphibian	79%	N	79%	5%	Assumed equal to fish diet
Osprey	Aquatic	23%	N	23%	5%	US EPA 1993; Ducks consuming aquatic vegetation
Osprey	Benthic	77%	N	77%	8%	Assumed equal to avian species/birds
Osprey	Berries	64%	N	64%	15%	Assumed equal to avian species/birds
Osprey	Conifer	34%	N	34%	5%	Assumed equal to avian species/birds
Osprey	Detritus	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Osprey	Fish	79%	N	79%	5%	Assumed equal to avian species/birds
Osprey	Flying	87%	N	87%	5%	US EPA 1993; Insects (mean of 6 studies)
Osprey	Grass	41%	N	41%	9%	US EPA 1993; Mature grasses (mean of 5 studies)
Osprey	Herb	73%	N	73%	8%	US EPA 1993; Green forbs (mean of 8 studies)
Osprey	Insect	87%	N	87%	5%	US EPA 1993; Insects (mean of 6 studies)
Osprey	Lichen	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
Osprey	Mammal	84%	N	84%	7%	US EPA 1993; Small birds, mammals (mean of 4 studies)
Osprey	Root	56%	N	56%	18%	Assumed equal to avian species/birds
Osprey	Seeds	85%	N	85%	7%	US EPA 1993; Seed, nuts (mean of 8 studies)
Osprey	Shrub	76%	N	76%	8%	US EPA 1993; "Herbivory" (mean of 5 studies)
Osprey	Worm	72%	N	72%	5%	Assumed equal to avian species/birds
River_Otter	Amphibian	79%	N	79%	5%	Assumed equal to fish diet
River_Otter	Aquatic	23%	N	23%	5%	US EPA 1993; Ducks consuming aquatic vegetation
River_Otter	Benthic	77%	N	77%	8%	Assumed equal to avian species/birds
River_Otter	Berries	64%	N	64%	15%	Assumed equal to avian species/birds
River_Otter	Conifer	34%	N	34%	5%	Assumed equal to avian species/birds
River_Otter	Detritus	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
River_Otter	Fish	79%	N	79%	5%	Assumed equal to avian species/birds

Table A-9. Assimilation Efficiency (AE) of Dietary Items [Percent% Efficiency]

Receptor	Dietary Item	Value	Distribution	Avg	StDev	Reference/Comments
River_Otter	Flying	87%	N	87%	5%	US EPA 1993; Insects (mean of 6 studies)
River_Otter	Grass	41%	N	41%	9%	US EPA 1993; Mature grasses (mean of 5 studies)
River_Otter	Herb	73%	N	73%	8%	US EPA 1993; Green forbs (mean of 8 studies)
River_Otter	Insect	87%	N	87%	5%	US EPA 1993; Insects (mean of 6 studies)
River_Otter	Lichen	47%	N	47%	10%	Assumed equal to Lewis Woodpecker
River_Otter	Mammal	84%	N	84%	7%	US EPA 1993; Small birds, mammals (mean of 4 studies)
River_Otter	Root	56%	N	56%	18%	Assumed equal to avian species/birds
River_Otter	Seeds	85%	N	85%	7%	US EPA 1993; Seed, nuts (mean of 8 studies)
River_Otter	Shrub	76%	N	76%	8%	US EPA 1993; "Herbivory" (mean of 5 studies)
River_Otter	Worm	72%	N	72%	5%	Assumed equal to avian species/birds

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Fate and Transport Variables

Table A-10. Literature and Site-specific Derived Regression Models and Bio-Concentration Factors from Soil to Seleceted Media [Dry Weight Basis]

		Regression Variables		Regression Error			BCF				Reference	
Media	**Chemical**	**Constant Average**	**Coeff#1 Average**	**Value**	**Error Average**	**Error StDev**	**Value**	**Average**	**StDev**	**Model**	**Regression**	**Uptake Factor**
Aquatic	Arsenic						856			BCF_Normal		US EPA 1999
Aquatic	Cadmium						2,283			BCF_Normal		US EPA 1999
Aquatic	Chromium						12,866			BCF_Normal		US EPA 1999
Aquatic	Cobalt											
Aquatic	Copper						1,580			BCF_Normal		US EPA 1999
Aquatic	Lead						4,982			BCF_Normal		US EPA 1999
Aquatic	Mercury						72,305			BCF_Normal		US EPA 1999
Aquatic	Inorganic_Mercury						72,305			BCF_Normal		US EPA 1999
Aquatic	Methyl_Mercury						233,600			BCF_Normal		US EPA 1999
Aquatic	Nickel						178			BCF_Normal		US EPA 1999
Aquatic	Selenium						5387			BCF_Normal		US EPA 1999
Aquatic	Silver						31,232			BCF_Normal		US EPA 1999
Aquatic	Thallium											
Aquatic	Zinc						6,351			BCF_Normal		US EPA 1999
Benthic	Arsenic	5.66E-01	2.89E-01	0.00E+00	0.00E+00	1.61E-01				Log_Normal	BJC 1998	
Benthic	Cadmium	-3.14E-01	5.13E-01	0.00E+00	0.00E+00	7.28E-01				Log_Normal	BJC 1998	
Benthic	Chromium						2.34E+00			BCF_Normal		US EPA 1999
Benthic	Cobalt											
Benthic	Copper	1.09E+00	2.78E-01	0.00E+00	0.00E+00	3.01E-01				Log_Normal	BJC 1998	
Benthic	Lead	-5.15E-01	6.53E-01	0.00E+00	0.00E+00	3.85E-01				Log_Normal	BJC 1998	
Benthic	Mercury						1.42E+00	1.42E+00	9.40E-01	BCF_Log		BJC 1998
Benthic	Inorganic_Mercury											
Benthic	Methyl_Mercury											
Benthic	Nickel	-4.40E-01	6.95E-01	0.00E+00	0.00E+00	2.13E-01				Log_Normal	BJC 1998	
Benthic	Selenium	1.57E+00	5.19E-01	0.00E+00	0.00E+00	3.80E-01				Ln_Normal		Table 5 Hamilton & Bu
Benthic	Silver						5.39E+00			BCF_Normal		US EPA 1999
Benthic	Thallium											
Benthic	Zinc	1.89E+00	1.26E-01	0.00E+00	0.00E+00	1.93E-01				Log_Normal	BJC 1998	
Berries	Arsenic						6.00E-03			BCF_Normal		Baes et al. 1984
Berries	Cadmium						1.50E-01			BCF_Normal		Baes et al. 1984
Berries	Chromium											
Berries	Cobalt											
Berries	Copper						2.50E-01			BCF_Normal		Baes et al. 1984
Berries	Lead						9.00E-03			BCF_Normal		Baes et al. 1984
Berries	Mercury						2.00E-01			BCF_Normal		Baes et al. 1984
Berries	Inorganic_Mercury											
Berries	Methyl_Mercury											
Berries	Nickel											
Berries	Selenium											
Berries	Silver											
Berries	Thallium											
Berries	Zinc						9.00E-01			BCF_Normal		Baes et al. 1984
Detritus	Arsenic	-1.25E-01	3.28E-02	0.00E+00	0.00E+00	5.47E-01				Normal	Assumed = grass	
Detritus	Cadmium						4.33E-01	4.33E-01	4.11E-01	BCF_Log	Assumed = grass	
Detritus	Chromium											
Detritus	Cobalt											
Detritus	Copper	6.35E+00	1.02E-01	0.00E+00	0.00E+00	3.05E+00				Normal	Assumed = grass	

Table A-10. Literature and Site-specific Derived Regression Models and Bio-Concentration Factors from Soil to Seleceted Media [Dry Weight Basis]

		Regression Variables		Regression Error			BCF				Reference	
Media	Chemical	Constant Average	Coeff#1 Average	Value	Error Average	Error StDev	Value	Average	StDev	Model	Regression	Uptake Factor
Detritus	Lead	1.89E+00	2.95E-02	0.00E+00	0.00E+00	1.06E+01				Normal	Assumed = grass	
Detritus	Mercury	2.61E-02	5.95E-02	0.00E+00	0.00E+00	1.94E-02				Normal	Assumed = grass	
Detritus	Inorganic_Mercury											
Detritus	Methyl_Mercury											
Detritus	Nickel											
Detritus	Selenium											
Detritus	Silver											
Detritus	Thallium											
Detritus	Zinc	2.99E+01	6.17E-01	0.00E+00	0.00E+00	1.72E+02				Normal	Assumed = grass	
Grass	Arsenic	-1.25E-01	3.28E-02	0.00E+00	0.00E+00	5.47E-01				Normal	Site-specific	
Grass	Cadmium						4.33E-01	4.33E-01	4.11E-01	BCF_Log	Site-specific	
Grass	Chromium						4.50E-03			BCF_Normal		Baes et al. 1984
Grass	Cobalt											
Grass	Copper	6.35E+00	1.02E-01	0.00E+00	0.00E+00	3.05E+00				Normal	Site-specific	
Grass	Lead	1.89E+00	2.95E-02	0.00E+00	0.00E+00	1.06E+01				Normal	Site-specific	
Grass	Mercury	2.61E-02	5.95E-02	0.00E+00	0.00E+00	1.94E-02				Normal	Site-specific	
Grass	Inorganic_Mercury											
Grass	Methyl_Mercury											
Grass	Nickel	-2.22E+00	7.48E-01	0.00E+00	0.00E+00	2.10E+00				Ln_Normal	BJC 1998	
Grass	Selenium	-6.78E-01	1.10E+00	0.00E+00	0.00E+00	1.52E+00				Ln_Normal	BJC 1998	
Grass	Silver						1.00E-01			BCF_Normal		Baes et al. 1984
Grass	Thallium											
Grass	Zinc	2.99E+01	6.17E-01	0.00E+00	0.00E+00	1.72E+02				Normal	Site-specific	
Herb	Arsenic	-1.25E-01	3.28E-02	0.00E+00	0.00E+00	5.47E-01				Normal	Assumed = grass	
Herb	Cadmium						4.33E-01	4.33E-01	4.11E-01	BCF_Log	Assumed = grass	
Herb	Chromium											
Herb	Cobalt											
Herb	Copper	6.35E+00	1.02E-01	0.00E+00	0.00E+00	3.05E+00				Normal	Assumed = grass	
Herb	Lead	1.89E+00	2.95E-02	0.00E+00	0.00E+00	1.06E+01				Normal	Assumed = grass	
Herb	Mercury	2.61E-02	5.95E-02	0.00E+00	0.00E+00	1.94E-02				Normal	Assumed = grass	
Herb	Inorganic_Mercury											
Herb	Methyl_Mercury											
Herb	Nickel											
Herb	Selenium											
Herb	Silver											
Herb	Thallium											
Herb	Zinc	2.99E+01	6.17E-01	0.00E+00	0.00E+00	1.72E+02				Normal	Assumed = grass	
Insect	Arsenic						1.49E-01	1.49E-01	1.91E-01	BCF_Log	Site-specific	
Insect	Cadmium						5.41E+00	5.41E+00	6.70340972	BCF_Log		Site-specific
Insect	Chromium						1.10E+00	1.10E+00	2	BCF_Log		Sample et al.1998
Insect	Cobalt											
Insect	Copper						1.41E+00	1.41E+00	1.86E+00	BCF_Log		Site-specific
Insect	Lead	1.85E-01	4.86E-01	0.00E+00	0.00E+00	1.00E+00				Power	Site-specific	
Insect	Mercury						1.18E+00	1.18E+00	1.42E+00	BCF_Log		Site-specific
Insect	Inorganic_Mercury											
Insect	Methyl_Mercury											
Insect	Nickel						1.70E+00	1.70E+00	1.90E+00	BCF_Log		Sample et al.1998

Table A-10. Literature and Site-specific Derived Regression Models and Bio-Concentration Factors from Soil to Seleceted Media [Dry Weight Basis]

		Regression Variables		Regression Error			BCF				Reference	
Media	**Chemical**	**Constant Average**	**Coeff#1 Average**	**Value**	**Error Average**	**Error StDev**	**Value**	**Average**	**StDev**	**Model**	**Regression**	**Uptake Factor**
Insect	Selenium	-7.50E-02	7.33E-01	0.00E+00	0.00E+00	4.85E-01				Ln_Normal		Sample et al.1998
Insect	Silver						4.52E+00	4.52E+00	6.41E+00	BCF_Normal		Sample et al.1998
Insect	Thallium											
Insect	Zinc						1.44E+00	1.44E+00	1.41E+00	BCF_Log		Site-specific
Mammal	Arsenic	-4.85E+00	8.19E-01	0.00E+00	0.00E+00	1.18E+00				Ln_Normal	Sample et al.1998a	
Mammal	Cadmium	-1.26E+00	4.72E-01	0.00E+00	0.00E+00	6.22E-01				Ln_Normal	Sample et al.1998a	
Mammal	Chromium											
Mammal	Cobalt											
Mammal	Copper	2.04E+00	1.44E-01	0.00E+00	0.00E+00	4.07E-01				Ln_Normal	Sample et al.1998a	
Mammal	Lead	7.61E-02	4.42E-01	0.00E+00	0.00E+00	9.72E-01				Ln_Normal	Sample et al.1998a	
Mammal	Mercury						1.24E-01	1.24E-01	2.34E-01	BCF_Log		Sample et al.1998a
Mammal	Inorganic_Mercury											
Mammal	Methyl_Mercury											
Mammal	Nickel											
Mammal	Selenium											
Mammal	Silver											
Mammal	Thallium											
Mammal	Zinc	4.47E+00	7.38E-02	0.00E+00	0.00E+00	3.36E-01				Ln_Normal	Sample et al.1998a	
Root	Arsenic						6.00E-03			BCF_Normal		Baes et al. 1984
Root	Cadmium						1.50E-01			BCF_Normal		Baes et al. 1984
Root	Chromium											
Root	Cobalt											
Root	Copper						2.50E-01			BCF_Normal		Baes et al. 1984
Root	Lead						9.00E-03			BCF_Normal		Baes et al. 1984
Root	Mercury						2.00E-01			BCF_Normal		Baes et al. 1984
Root	Inorganic_Mercury											
Root	Methyl_Mercury											
Root	Nickel											
Root	Selenium											
Root	Silver											
Root	Thallium											
Root	Zinc						9.00E-01			BCF_Normal		Baes et al. 1984
Seeds	Arsenic						6.00E-03			BCF_Normal		Assumed = berries
Seeds	Cadmium						1.50E-01			BCF_Normal		Assumed = berries
Seeds	Chromium						4.50E-03			BCF_Normal		Assumed = berries
Seeds	Cobalt											
Seeds	Copper						2.50E-01			BCF_Normal		Assumed = berries
Seeds	Lead						9.00E-03			BCF_Normal		Assumed = berries
Seeds	Mercury						2.00E-01			BCF_Normal		Assumed = berries
Seeds	Inorganic_Mercury											
Seeds	Methyl_Mercury											
Seeds	Nickel						6.00E-02			BCF_Normal		Assumed = berries
Seeds	Selenium						2.50E-02			BCF_Normal		Assumed = berries
Seeds	Silver						1.00E-01			BCF_Normal		Assumed = berries
Seeds	Thallium											
Seeds	Zinc						9.00E-01			BCF_Normal		Assumed = berries
Shrub	Arsenic	-3.83E+00	6.70E-01	0.00E+00	0.00E+00	5.91E-01				Power	Site-specific	

Table A-10. Literature and Site-specific Derived Regression Models and Bio-Concentration Factors from Soil to Seleceted Media [Dry Weight Basis]

		Regression Variables		Regression Error			BCF				Reference	
Media	**Chemical**	**Constant Average**	**Coeff#1 Average**	**Value**	**Error Average**	**Error StDev**	**Value**	**Average**	**StDev**	**Model**	**Regression**	**Uptake Factor**
Shrub	Cadmium						3.50E-01	3.50E-01	4.20E-01	BCF_Log	Site-specific	
Shrub	Chromium											
Shrub	Cobalt											
Shrub	Copper						4.23E-01	4.23E-01	3.08E-01	BCF_Log	Site-specific	
Shrub	Lead	-1.91E+00	6.74E-01	0.00E+00	0.00E+00	9.01E-01				Power	Site-specific	
Shrub	Mercury						1.86E-01	1.86E-01	1.15E-01	BCF_Log	Site-specific	
Shrub	Inorganic_Mercury											
Shrub	Methyl_Mercury											
Shrub	Nickel											
Shrub	Selenium											
Shrub	Silver											
Shrub	Thallium											
Shrub	Zinc						1.03E+00	1.03E+00	1.40E+00	BCF_Log	Site-specific	
Worm	Arsenic	9.28E-01	1.38E+00	0.00E+00	0.00E+00	2.54E+01				Normal	Site-specific	
Worm	Cadmium	5.34E+01	5.38E+00	0.00E+00	0.00E+00	3.90E+01				Normal	Site-specific	
Worm	Chromium											
Worm	Cobalt											
Worm	Copper	8.94E-01	2.43E-01	0.00E+00	0.00E+00	1.23E-01				Log_Normal	Site-specific	
Worm	Lead	5.67E+01	3.40E-01	0.00E+00	0.00E+00	1.57E+02				Normal	Site-specific	
Worm	Mercury	3.84E-01	7.27E-02	0.00E+00	0.00E+00	1.33E-01				Log	Site-specific	
Worm	Inorganic_Mercury											
Worm	Methyl_Mercury											
Worm	Nickel											
Worm	Selenium											
Worm	Silver											
Worm	Thallium											
Worm	Zinc						3.55E+00	3.55E+00	2.65E+00	BCF_Log	Site-specific	

Notes:
The BCFs for benthic from US EPA 1999 were multiplied by a factor of 5.99 to convert the wet weight BCF to dry weight

Measured Concentrations

Table A-11. Summary Statistics of Media Concentrations

							Value				Test	Assumed
Site	**Chemical**	**Media**	**Units**	**Average**	**StDev**	**Min**	**Max**	**N**	**LCLM95**	**UCLM95**	**UCLM95>Max**	**Distribution**
AOI	Arsenic	Soil	ug/g	1.72E+01	1.72E+01	1.20E+00	1.30E+02	305	1.53E+01	1.92E+01	No	Log-Normal
AOI	Cadmium	Soil	ug/g	2.77E+00	3.00E+00	1.00E-01	2.58E+01	305	2.43E+00	3.10E+00	No	Log-Normal
AOI	Copper	Soil	ug/g	2.01E+01	2.67E+01	2.00E+00	3.26E+02	305	1.71E+01	2.30E+01	No	Log-Normal
AOI	Lead	Soil	ug/g	1.77E+02	3.23E+02	2.00E+00	3.33E+03	305	1.41E+02	2.13E+02	No	Log-Normal
AOI	Mercury	Soil	ug/g	8.58E-02	1.34E-01	5.00E-04	1.45E+00	304	7.07E-02	1.01E-01	No	Log-Normal
AOI	Zinc	Soil	ug/g	1.49E+02	1.48E+02	1.40E+01	1.33E+03	305	1.32E+02	1.66E+02	No	Log-Normal
AOI	Arsenic	Tributary Sediment	ppm	3.67E+00	4.05E+00	6.00E-01	1.96E+01	27	2.15E+00	5.20E+00	No	Log-Normal
AOI	Cadmium	Tributary Sediment	ppm	4.41E-01	4.92E-01	1.00E-01	2.77E+00	27	2.55E-01	6.27E-01	No	Log-Normal
AOI	Copper	Tributary Sediment	ppm	1.62E+01	1.57E+01	5.00E+00	8.09E+01	27	1.02E+01	2.21E+01	No	Log-Normal
AOI	Mercury	Tributary Sediment	ppm	1.48E-02	2.11E-02	5.00E-03	1.10E-01	27	6.86E-03	2.28E-02	No	Log-Normal
AOI	Lead	Tributary Sediment	ppm	2.07E+01	5.15E+01	3.20E+00	2.77E+02	27	1.27E+00	4.01E+01	No	Log-Normal
AOI	Zinc	Tributary Sediment	ppm	6.79E+01	5.63E+01	2.60E+01	3.18E+02	27	4.66E+01	8.91E+01	No	Log-Normal
AOI	Arsenic	MainStem Sediment	ppm	8.22E+00	8.21E+00	5.58E-01	3.31E+01	23	4.87E+00	1.16E+01	No	Log-Normal
AOI	Cadmium	MainStem Sediment	ppm	8.68E-01	7.67E-01	8.00E-02	3.16E+00	23	5.54E-01	1.18E+00	No	Log-Normal
AOI	Copper	MainStem Sediment	ppm	4.79E+02	7.84E+02	1.80E+00	3.43E+03	23	1.59E+02	8.00E+02	No	Log-Normal
AOI	Mercury	MainStem Sediment	ppm	1.50E-01	2.71E-01	1.00E-03	1.24E+00	23	3.95E-02	2.61E-01	No	Log-Normal
AOI	Lead	MainStem Sediment	ppm	1.11E+02	1.20E+02	1.62E+00	4.55E+02	23	6.18E+01	1.60E+02	No	Log-Normal
AOI	Zinc	MainStem Sediment	ppm	3.38E+03	5.90E+03	1.89E+01	2.31E+04	23	9.70E+02	5.79E+03	No	Log-Normal
AOI	Arsenic	Trib & MainStem Sediment	ppm	5.77E+00	6.65E+00	5.58E-01	3.31E+01	50	3.92E+00	7.61E+00	No	Log-Normal
AOI	Cadmium	Trib & MainStem Sediment	ppm	6.37E-01	6.63E-01	8.00E-02	3.16E+00	50	4.54E-01	8.21E-01	No	Log-Normal
AOI	Copper	Trib & MainStem Sediment	ppm	2.29E+02	5.75E+02	1.80E+00	3.43E+03	50	6.99E+01	3.89E+02	No	Log-Normal
AOI	Mercury	Trib & MainStem Sediment	ppm	7.70E-02	1.94E-01	1.00E-03	1.24E+00	50	2.32E-02	1.31E-01	No	Log-Normal
AOI	Lead	Trib & MainStem Sediment	ppm	6.21E+01	9.96E+01	1.62E+00	4.55E+02	50	3.45E+01	8.97E+01	No	Log-Normal
AOI	Zinc	Trib & MainStem Sediment	ppm	1.59E+03	4.29E+03	1.89E+01	2.31E+04	50	4.03E+02	2.78E+03	No	Log-Normal
AOI	Arsenic	Tributary Water Quality	ppm	1.96E-02	1.04E-01	2.50E-04	1.18E+00	207	5.40E-03	3.38E-02	No	Log-Normal
AOI	Cadmium	Tributary Water Quality	ppm	3.78E-03	1.71E-02	2.50E-05	1.82E-01	207	1.45E-03	6.12E-03	No	Log-Normal
AOI	Copper	Tributary Water Quality	ppm	2.57E-03	7.40E-03	2.50E-04	6.90E-02	207	1.56E-03	3.57E-03	No	Log-Normal
AOI	Lead	Tributary Water Quality	ppm	6.93E-03	2.63E-02	5.00E-05	1.96E-01	207	3.35E-03	1.05E-02	No	Log-Normal
AOI	Mercury	Tributary Water Quality	ppm	5.46E-05	2.94E-05	5.00E-05	4.00E-04	207	5.06E-05	5.86E-05	No	Log-Normal
AOI	Zinc	Tributary Water Quality	ppm	1.80E-01	7.67E-01	5.00E-04	8.38E+00	207	7.59E-02	2.85E-01	No	Log-Normal
AOI	Arsenic	Flying Insects	ug/g dw	1.40E+00	9.22E-01	4.46E-01	3.60E+00	18	9.71E-01	1.82E+00	No	Log-Normal
AOI	Cadmium	Flying Insects	ug/g dw	1.14E+01	1.51E+01	1.25E-01	5.87E+01	18	4.38E+00	1.83E+01	No	Log-Normal
AOI	Copper	Flying Insects	ug/g dw	4.18E+01	2.69E+01	1.16E+01	9.94E+01	12	2.66E+01	5.70E+01	No	Log-Normal
AOI	Lead	Flying Insects	ug/g dw	1.94E+01	1.59E+01	2.48E+00	6.38E+01	18	1.21E+01	2.67E+01	No	Log-Normal
AOI	Mercury	Flying Insects	ug/g dw	na	na	na	na	na	na	na	na	na
AOI	Zinc	Flying Insects	ug/g dw	3.66E+02	2.43E+02	1.40E+02	1.08E+03	18	2.54E+02	4.79E+02	No	Log-Normal
AOI	Arsenic	Conifer	ug/g dw	1.72E+00	4.70E+00	5.00E-02	2.13E+01	26	-8.97E-02	3.52E+00	No	Gamma
AOI	Cadmium	Conifer	ug/g dw	5.47E-01	3.20E-01	1.10E-01	1.38E+00	26	4.23E-01	6.70E-01	No	Log-Normal
AOI	Copper	Conifer	ug/g dw	2.78E+00	6.35E-01	1.90E+00	4.20E+00	26	2.53E+00	3.02E+00	No	Log-Normal
AOI	Lead	Conifer	ug/g dw	1.68E+00	1.36E+00	5.00E-01	5.30E+00	26	1.16E+00	2.21E+00	No	Log-Normal
AOI	Mercury	Conifer	ug/g dw	1.18E-02	4.78E-03	5.00E-03	2.30E-02	26	9.97E-03	1.36E-02	No	Log-Normal
AOI	Zinc	Conifer	ug/g dw	5.40E+01	2.43E+01	2.32E+01	1.20E+02	26	4.47E+01	6.33E+01	No	Log-Normal
AOI	Arsenic	Lichen	ug/g dw	1.91E+00	9.49E-01	5.00E-01	9.00E+00	101	1.72E+00	2.09E+00	No	Gamma
AOI	Cadmium	Lichen	ug/g dw	4.88E+00	3.26E+00	8.50E-01	2.30E+01	101	4.24E+00	5.51E+00	No	Log-Normal
AOI	Copper	Lichen	ug/g dw	7.17E+00	3.33E+00	3.00E+00	2.50E+01	101	6.52E+00	7.82E+00	No	Log-Normal
AOI	Lead	Lichen	ug/g dw	1.13E+02	6.49E+01	6.00E+00	3.31E+02	101	1.00E+02	1.26E+02	No	Log-Normal
AOI	Mercury	Lichen	ug/g dw	1.84E-01	1.97E-01	3.70E-02	1.00E+00	39	1.22E-01	2.46E-01	No	Log-Normal

Table A-11. Summary Statistics of Media Concentrations

Site	Chemical	Media	Units	Value							Test UCLM95>Max	Assumed Distribution
				Average	StDev	Min	Max	N	LCLM95	UCLM95		
AOI	Zinc	Lichen	ug/g dw	2.32E+02	1.33E+02	3.90E+01	7.23E+02	101	2.06E+02	2.58E+02	No	Log-Normal
AOI	Arsenic	Amphibian	ug/g dw	9.21E-01	1.08E+00	8.64E-02	2.16E+00	5	-2.97E-02	1.87E+00	No	Gamma
AOI	Cadmium	Amphibian	ug/g dw	7.11E-01	7.42E-01	1.12E-01	1.90E+00	5	6.02E-02	1.36E+00	No	Normal
AOI	Copper	Amphibian	ug/g dw	3.31E+00	1.07E+00	2.44E+00	5.16E+00	5	2.38E+00	4.24E+00	No	Normal
AOI	Lead	Amphibian	ug/g dw	6.95E+00	9.69E+00	6.50E-01	2.32E+01	5	-1.54E+00	1.54E+01	No	Gamma
AOI	Mercury	Amphibian	ug/g dw	1.67E-01	9.10E-02	9.00E-02	3.10E-01	5	8.69E-02	2.46E-01	No	Normal
AOI	Zinc	Amphibian	ug/g dw	3.34E+01	1.87E+01	1.69E+01	6.35E+01	5	1.70E+01	4.99E+01	No	Normal
AOI	Arsenic	Fish MainStem(2001)	ug/g dw	7.68E-01	6.27E-01	2.00E-01	2.80E+00	40	5.73E-01	9.62E-01	No	Log-Normal
AOI	Cadmium	Fish MainStem(2001)	ug/g dw	6.37E-01	8.97E-01	3.00E-02	2.94E+00	40	3.59E-01	9.15E-01	No	Log-Normal
AOI	Copper	Fish MainStem(2001)	ug/g dw	7.97E+00	9.41E+00	1.30E+00	4.39E+01	40	5.05E+00	1.09E+01	No	Log-Normal
AOI	Lead	Fish MainStem(2001)	ug/g dw	7.54E+00	1.54E+01	5.00E-02	6.29E+01	40	2.77E+00	1.23E+01	No	Log-Normal
AOI	Mercury	Fish MainStem(2001)	ug/g dw	3.38E-01	3.26E-01	3.00E-02	1.36E+00	40	2.37E-01	4.39E-01	No	Log-Normal
AOI	Zinc	Fish MainStem(2001)	ug/g dw	9.80E+01	6.87E+01	3.00E+01	3.36E+02	40	7.67E+01	1.19E+02	No	Log-Normal
AOI	Arsenic	Fish MainStem(2001&2004)	ug/g dw	3.26E-01	4.05E-01	4.84E-02	2.80E+00	168	2.64E-01	3.87E-01	No	Log-Normal
AOI	Cadmium	Fish MainStem(2001&2004)	ug/g dw	1.63E-01	5.09E-01	6.00E-04	2.94E+00	168	8.59E-02	2.40E-01	No	Log-Normal
AOI	Copper	Fish MainStem(2001&2004)	ug/g dw	2.52E+00	5.48E+00	4.90E-01	4.39E+01	168	1.69E+00	3.35E+00	No	Log-Normal
AOI	Lead	Fish MainStem(2001&2004)	ug/g dw	1.91E+00	8.08E+00	6.00E-04	6.29E+01	168	6.87E-01	3.13E+00	No	Log-Normal
AOI	Mercury	Fish MainStem(2001&2004)	ug/g dw	3.24E-01	2.23E-01	3.00E-02	1.36E+00	168	2.90E-01	3.58E-01	No	Log-Normal
AOI	Zinc	Fish MainStem(2001&2004)	ug/g dw	4.17E+01	4.69E+01	1.05E+01	3.36E+02	168	3.46E+01	4.88E+01	No	Log-Normal

APPENDIX B

INPUT ASSUMPTIONS FOR PROBABILISTIC RISK MODEL

Assumptions

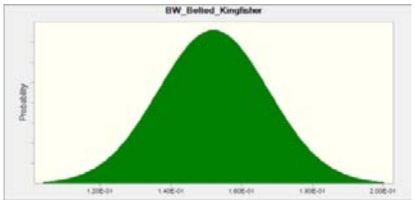
Worksheet: [LOR3 Appendix A(September2013).xlsm]Exposure Variables

Assumption: BW_Belted_Kingfisher

Cell: D5

Normal distribution with parameters:

Mean	1.52E-01	(=F5)
Std. Dev.	1.56E-02	(=G5)

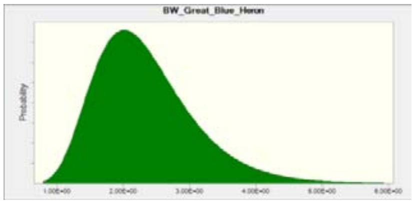


Assumption: BW_Great_Blue_Heron

Cell: D11

Lognormal distribution with parameters:

Location	0.00E+00	
Mean	2.34E+00	(=F11)
Std. Dev.	7.62E-01	(=G11)



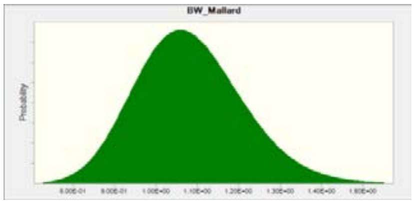
Assumption: BW_Mallard

Cell: D14

Lognormal distribution with parameters:

Location	0.00E+00	
Mean	1.08E+00	(=F14)
Std. Dev.	1.29E-01	(=G14)

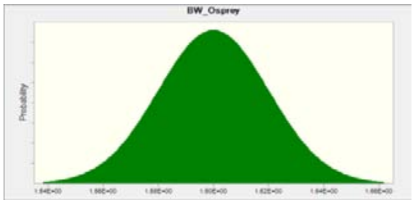
Assumption: BW_Mallard (cont'd) **Cell: D14**



Assumption: BW_Osprey **Cell: D15**

Normal distribution with parameters:

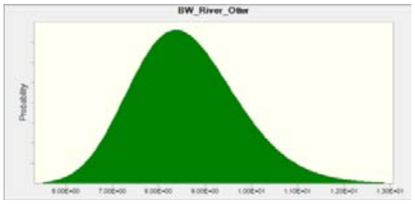
Mean	1.60E+00	(=F15)
Std. Dev.	2.00E-02	(=G15)



Assumption: BW_River_Otter **Cell: D16**

Lognormal distribution with parameters:

Location	0.00E+00	
Mean	8.60E+00	(=F16)
Std. Dev.	1.15E+00	(=G16)

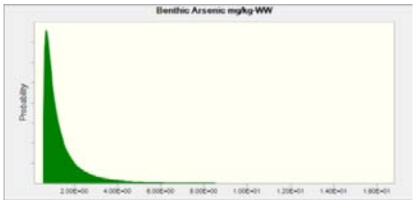


Worksheet: [SOLICITOR-CLIENT PRIVILEGED LOR3 Appendix A(September2013).xlsm]Exposure

Assumption: Benthic Arsenic mg/kg-WW **Cell: D17**

Lognormal distribution with parameters:

Location	5.30E-01
5%	6.20E-01
95%	3.80E+00



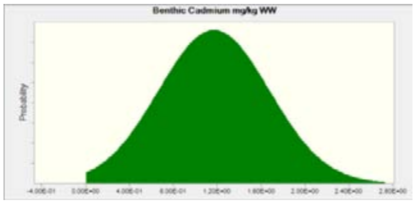
Assumption: Benthic Cadmium mg/kg WW

Cell: E17

Normal distribution with parameters:

5%	3.40E-01
95%	2.00E+00

Selected range is from 0.00E+00 to Infinity

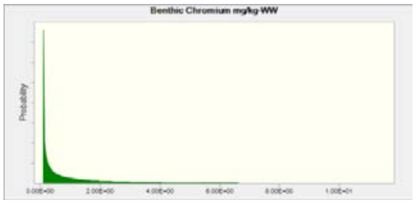


Assumption: Benthic Chromium mg/kg-WW

Cell: F17

Gamma distribution with parameters:

5%	8.00E-02
50%	4.50E-01
95%	5.20E+00

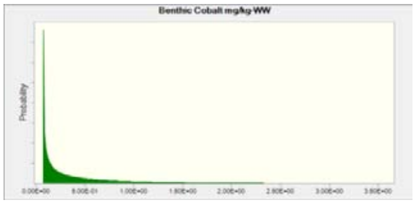


Assumption: Benthic Cobalt mg/kg-WW

Cell: G17

Gamma distribution with parameters:

5%	7.00E-02
50%	2.20E-01
95%	1.70E+00

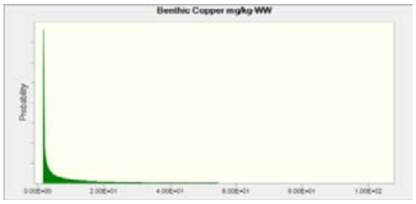


Assumption: Benthic Copper mg/kg-WW

Cell: H17

Gamma distribution with parameters:

5%	1.50E+00
50%	4.00E+00
95%	4.60E+01



Assumption: Benthic Lead mg/kg-WW

Cell: J17

Gamma distribution with parameters:

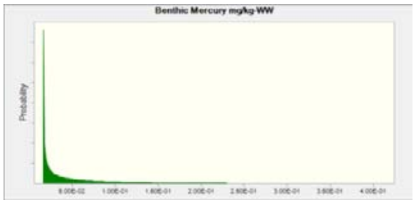
5%	5.70E-01
50%	3.40E+00
95%	6.30E+01

Assumption: Benthic Mercury mg/kg-WW

Cell: K17

Gamma distribution with parameters:

5%	1.60E-02
50%	2.70E-02
95%	1.90E-01

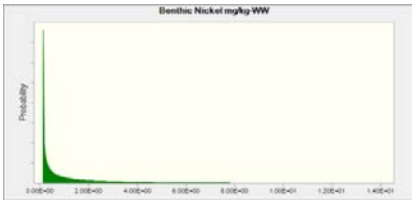


Assumption: Benthic Nickel mg/kg-WW

Cell: M17

Gamma distribution with parameters:

5%	1.00E-01
50%	5.10E-01
95%	6.30E+00



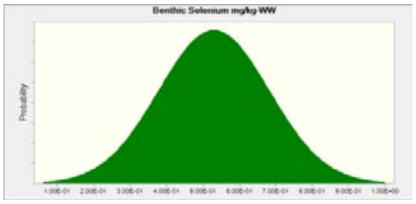
Assumption: Benthic Selenium mg/kg-WW

Cell: N17

Normal distribution with parameters:

5%	2.80E-01
95%	7.80E-01

Selected range is from 0.00E+00 to Infinity

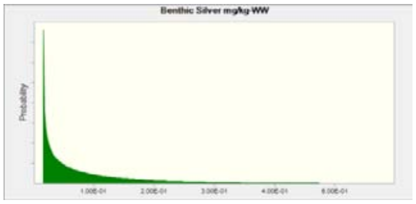


Assumption: Benthic Silver mg/kg-WW

Cell: O17

Gamma distribution with parameters:

5%	1.70E-02
50%	5.50E-02
95%	3.00E-01

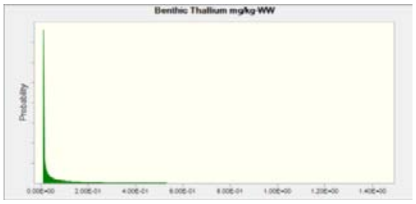


Assumption: Benthic Thallium mg/kg-WW

Cell: P17

Gamma distribution with parameters:

5%	9.00E-03
50%	2.00E-02
95%	5.50E-01



Assumption: Benthic Zinc mg/kg-WW

Cell: Q17

Gamma distribution with parameters:

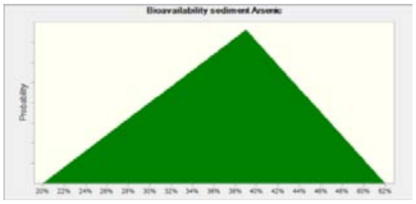
5%	2.30E+01
50%	3.90E+01
95%	1.59E+02

Assumption: Bioavailability sediment Arsenic

Cell: D24

Triangular distribution with parameters:

Minimum	20%
Likeliest	39%
Maximum	52%

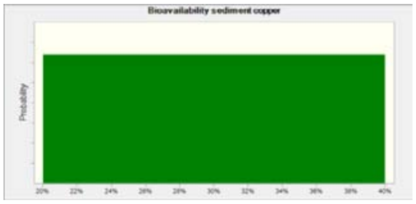


Assumption: Bioavailability sediment copper

Cell: H24

Uniform distribution with parameters:

Minimum	20%
Maximum	40%

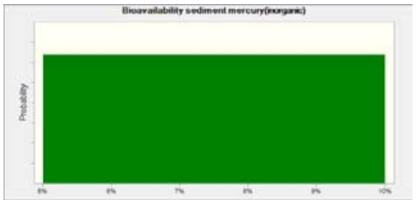


Assumption: Bioavailability sediment mercury(inorganic)

Cell: I24

Uniform distribution with parameters:

Minimum	5%
Maximum	10%

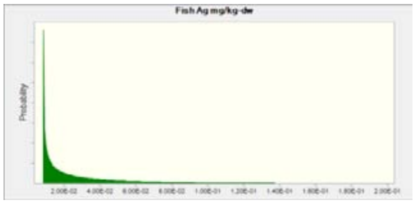


Assumption: Fish Ag mg/kg-dw

Cell: O18

Gamma distribution with parameters:

5%	8.00E-03
50%	1.70E-02
95%	9.80E-02

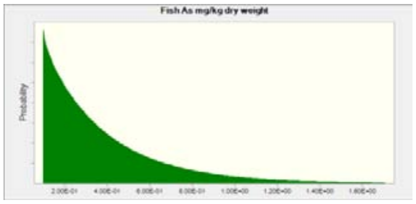


Assumption: Fish As mg/kg dry weight

Cell: D18

Gamma distribution with parameters:

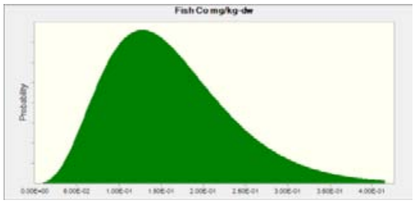
5%	1.10E-01
50%	3.00E-01
95%	1.00E+00



Assumption: Fish Co mg/kg-dw **Cell: G18**

Gamma distribution with parameters:

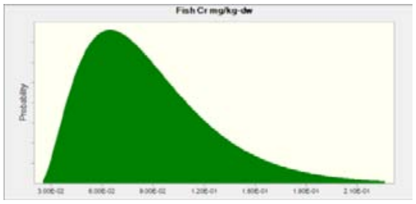
5%	6.00E-02
50%	1.50E-01
95%	3.00E-01



Assumption: Fish Cr mg/kg-dw **Cell: F18**

Gamma distribution with parameters:

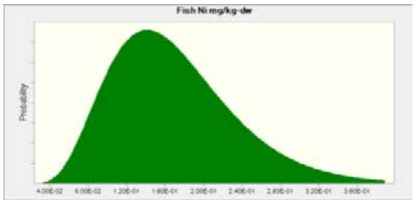
5%	4.00E-02
50%	8.00E-02
95%	1.60E-01



Assumption: Fish Ni mg/kg-dw **Cell: M18**

Gamma distribution with parameters:

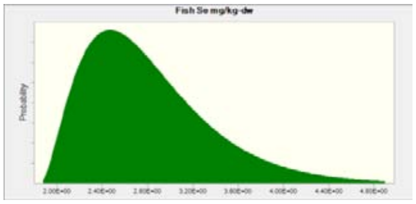
5%	8.00E-02
50%	1.60E-01
95%	2.90E-01



Assumption: Fish Se mg/kg-dw **Cell: N18**

Gamma distribution with parameters:

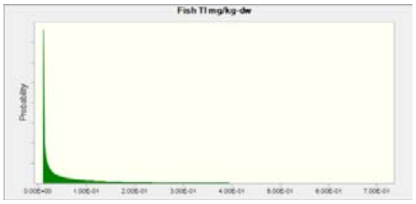
5%	2.10E+00
50%	2.70E+00
95%	3.90E+00



Assumption: Fish Tl mg/kg-dw **Cell: P18**

Gamma distribution with parameters:

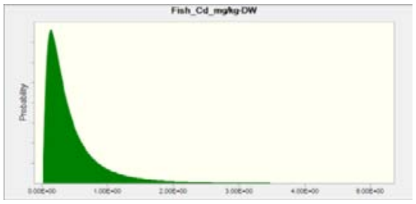
5%	1.00E-02
50%	3.00E-02
95%	3.20E-01



Assumption: Fish_Cd_mg/kg-DW **Cell: E18**

Lognormal distribution with parameters:

Location	0.00E+00
5%	7.00E-02
95%	1.40E+00

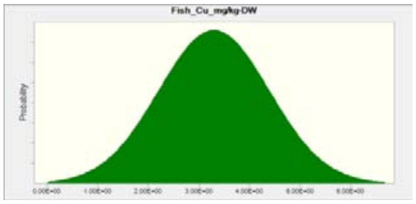


Assumption: Fish_Cu_mg/kg-DW **Cell: H18**

Normal distribution with parameters:

5%	1.50E+00
95%	5.10E+00

Selected range is from 0.00E+00 to Infinity

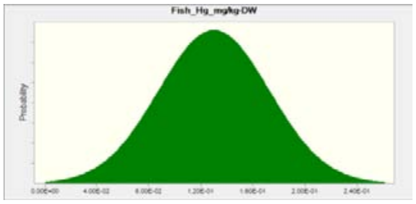


Assumption: Fish_Hg_mg/kg-DW **Cell: K18**

Normal distribution with parameters:

5%	6.00E-02
95%	2.00E-01

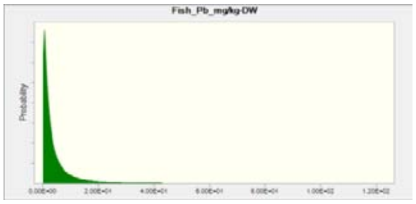
Selected range is from 0.00E+00 to Infinity



Assumption: Fish_Pb_mg/kg-DW **Cell: J18**

Lognormal distribution with parameters:

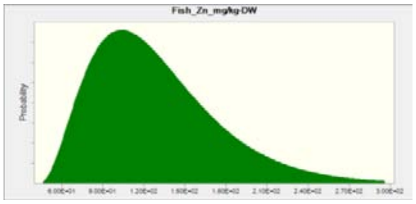
Location	0.00E+00
5%	2.70E-01
95%	1.90E+01



Assumption: Fish_Zn_mg/kg-DW **Cell: Q18**

Gamma distribution with parameters:

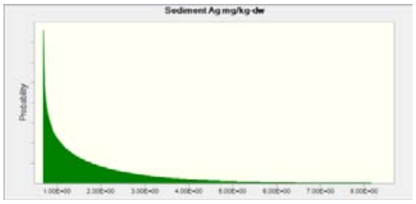
5%	6.90E+01
50%	1.21E+02
95%	2.18E+02



Assumption: Sediment Ag mg/kg-dw **Cell: O15**

Gamma distribution with parameters:

5%	7.00E-01
50%	1.40E+00
95%	4.80E+00

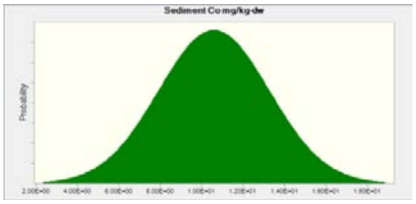


Assumption: Sediment Co mg/kg-dw **Cell: G15**

Normal distribution with parameters:

5%	6.20E+00
95%	1.50E+01

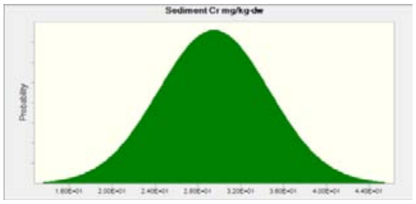
Selected range is from 0.00E+00 to Infinity



Assumption: Sediment Cr mg/kg-dw **Cell: F15**

Normal distribution with parameters:

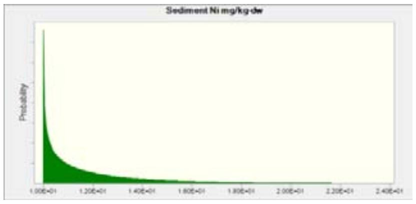
5%	2.10E+01
95%	3.80E+01



Assumption: Sediment Ni mg/kg-dw **Cell: M15**

Gamma distribution with parameters:

5%	1.00E+01
50%	1.10E+01
95%	1.70E+01

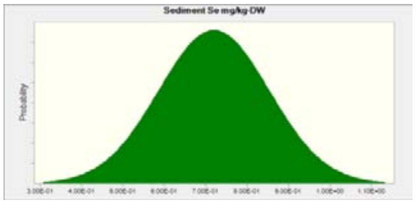


Assumption: Sediment Se mg/kg-DW **Cell: N15**

Normal distribution with parameters:

5%	5.00E-01
95%	9.40E-01

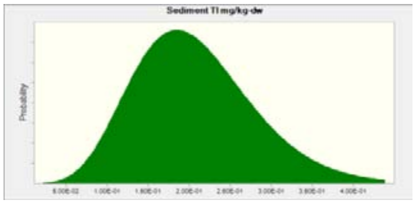
Selected range is from 0.00E+00 to Infinity



Assumption: Sediment Tl mg/kg-dw **Cell: P15**

Gamma distribution with parameters:

5%	1.00E-01
50%	2.00E-01
95%	3.40E-01

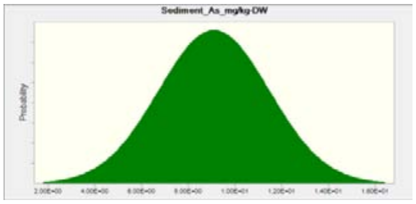


Assumption: Sediment_As_mg/kg-DW **Cell: D15**

Normal distribution with parameters:

5%	5.20E+00
95%	1.30E+01

Selected range is from 0.00E+00 to Infinity

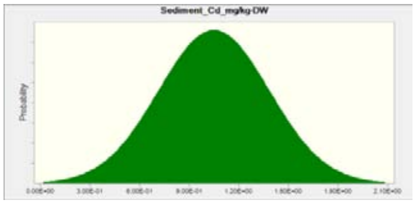


Assumption: Sediment_Cd_mg/kg-DW **Cell: E15**

Normal distribution with parameters:

5%	5.00E-01
95%	1.60E+00

Selected range is from 0.00E+00 to Infinity

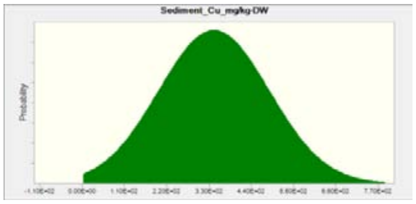


Assumption: Sediment_Cu_mg/kg-DW **Cell: H15**

Normal distribution with parameters:

5%	1.06E+02
95%	5.80E+02

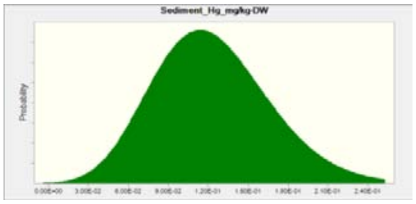
Selected range is from 0.00E+00 to Infinity



Assumption: Sediment_Hg_mg/kg-DW **Cell: K15**

Gamma distribution with parameters:

5%	5.60E-02
50%	1.20E-01
95%	2.00E-01

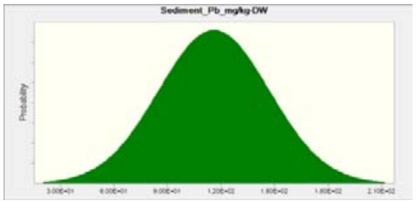


Assumption: Sediment_Pb_mg/kg-DW **Cell: J15**

Normal distribution with parameters:

5%	6.50E+01
95%	1.67E+02

Selected range is from 0.00E+00 to Infinity

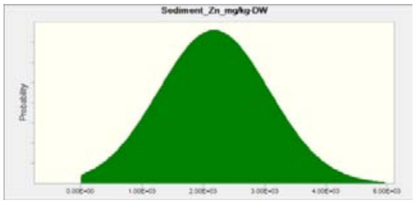


Assumption: Sediment_Zn_mg/kg-DW **Cell: Q15**

Normal distribution with parameters:

5%	6.89E+02
95%	3.66E+03

Selected range is from 0.00E+00 to Infinity

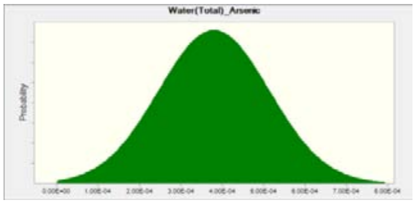


Assumption: Water(Total)_Arsenic **Cell: D16**

Normal distribution with parameters:

5%	1.60E-04
95%	6.00E-04

Selected range is from 0.00E+00 to Infinity



Assumption: Water(Total)_Cadmium **Cell: E16**

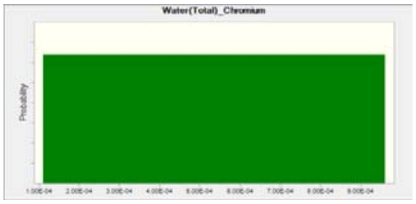
Gamma distribution with parameters:

5%	7.20E-06
50%	2.90E-05
95%	8.20E-04

Assumption: Water(Total)_Chromium **Cell: F16**

Uniform distribution with parameters:

Minimum	1.10E-04
Maximum	9.60E-04

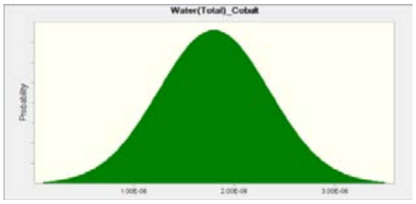


Assumption: Water(Total)_Cobalt **Cell: G16**

Normal distribution with parameters:

5%	8.90E-06
95%	2.70E-05

Selected range is from 0.00E+00 to Infinity

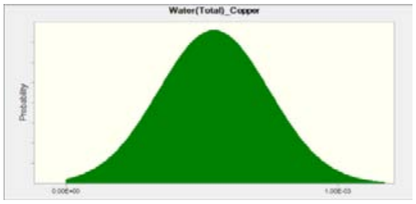


Assumption: Water(Total)_Copper **Cell: H16**

Normal distribution with parameters:

5%	2.10E-04
95%	8.80E-04

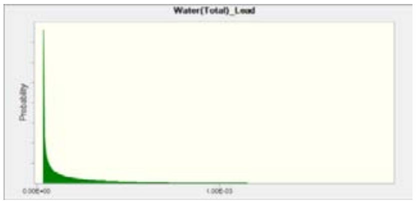
Selected range is from 0.00E+00 to Infinity



Assumption: Water(Total)_Lead **Cell: J16**

Gamma distribution with parameters:

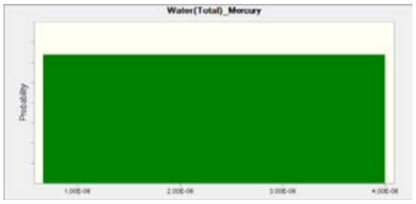
5%	3.30E-05
50%	9.80E-05
95%	8.80E-04



Assumption: Water(Total)_Mercury **Cell: K16**

Uniform distribution with parameters:

Minimum	6.60E-07
Maximum	4.00E-06

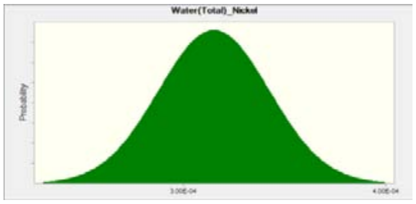


Assumption: Water(Total)_Nickel **Cell: M16**

Normal distribution with parameters:

5%	2.70E-04
95%	3.60E-04

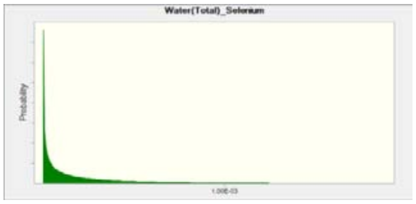
Selected range is from 0.00E+00 to Infinity



Assumption: Water(Total)_Selenium **Cell: N16**

Gamma distribution with parameters:

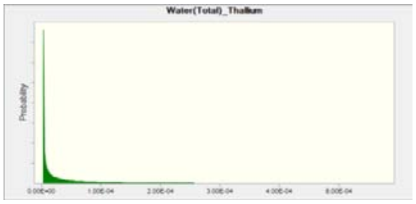
5%	1.60E-04
50%	2.30E-04
95%	9.00E-04



Assumption: Water(Total)_Thallium **Cell: P16**

Gamma distribution with parameters:

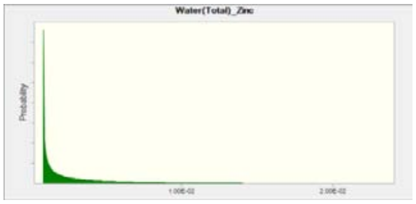
5%	2.10E-06
50%	9.30E-06
95%	2.30E-04



Assumption: Water(Total)_Zinc **Cell: Q16**

Gamma distribution with parameters:

5%	8.40E-04
50%	1.60E-03
95%	1.10E-02



End of Assumptions

APPENDIX K

TISSUE METALS IN BENTHIC INVERTEBRATES AND MUSSELS IN THE LOWER COLUMBIA RIVER 2012

Aquatic Receiving Environment Monitoring on the Columbia River

Additional Studies, Data Report

Tissue Metals in Benthic Invertebrates and Mussels in the Lower Columbia River 2012

Contract No.:932600-OS

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LIST OF ACRONYMS

Al	Aluminum
As	Arsenic
AREMP	Aquatic Receiving Environment Monitoring Program
BIR or BBK	Birchbank
BC MoE	British Columbia Ministry of Environment
CCME	Canadian Council of Ministers of the Environment
Cd	Cadmium
Cu	Copper
DO	Dissolved oxygen
Hg	Mercury
km	kilometer
ISQG	Interim sediment quality guideline
L	litre
LCR	Lower Columbia River
m	metre
max	maximum value
min	minimum value
N	nitrogen
n	sample size
NTU	nephlometric turbidity units
Pb	Lead
QA/QC	Quality assurance/quality control
SD	Standard deviation
Se	Selenium
TDS	total dissolved solids
Tl	Thallium
TSS	total suspended solids
TTS TML	Teck Trail Smelter TML Teck Metals Limited
UTM	Universal Transverse Mercator
Zn	Zinc

DEFINITIONS

The following terms are briefly defined as they are used in this report. For a more detailed definition, please refer to scientific publications.

Term	Definition
Benthic	Organisms that dwell in or are associated with the sediments
Benthic production	The production within the benthos originating from both periphyton and benthic invertebrates
Benthic invertebrates	Small (0.1 to >5 cm in length) animals that inhabit the bottom of aquatic systems. Most are insects and they feed on aquatic plants, algae, detritus
Benthos	The sum of the key benthic organisms (periphyton biofilms, benthic invertebrates, mussels)
Flow	The instantaneous volume of water flowing at any given time (e.g.1200 m^3/s)
Microflora	The sum of algae, bacteria, fungi, Actinomycetes, etc., in water or biofilms
Periphyton	Microflora that are attached to aquatic plants or solid substrates
Zooplankton	Minute animals that graze algae, bacteria and detritus in water bodies

Suggested Citation:

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1.0 INTRODUCTION

This tissue metals study was conducted to provide information to the Lower Columbia River Aquatic Receiving Environment Monitoring Program (AREMP). This report summarizes the findings from October 2012 benthic invertebrate and mussel tissue sample collection. This study was not part of the original AREMP project scope. The sample size was small and intended only to provide some insight on the responses of benthic invertebrates and mussels to current water quality in the Lower Columbia River. Information obtained from this study supplemented the Wildlife Modeling component of AREMP prepared by Intrinsik (2013).

2.0 PROJECT BACKGROUND

There are unique advantages to studying benthic invertebrate tissue metal concentrations over the metal concentrations in fish. Monitoring the metal content of benthic invertebrate tissue provides information on metal transfer between the periphyton and fish. There is one important disadvantage to studying tissue metals samples in organisms other than fish – there are no guidelines developed for benthic invertebrate tissue metal concentrations to use as comparatives.

Benthic macroinvertebrates are small animals that live in and on the sediments. They are a key part of aquatic food webs because they consume periphyton, zooplankton and detritus. In turn, they constitute prey for other macroinvertebrates, fish, and wildlife. Since benthic invertebrates consume stationary periphyton and are themselves confined to small foraging locations, their tissue metals can be assumed to have derived from a specific location, unlike fish which are far more mobile.

3.0 QUALITY ASSURANCE/QUALITY CONTROL

All sample labeling was confirmed by two researchers and recorded as the samples were collected. Photographs of the sample sites and the invertebrate collections were archived for future reference. All appropriate sample collection and lab procedures were followed.

4.0 METHODS

Benthic invertebrate composite samples were collected from the same areas (5 exposure, 2 reference) used for the AREMP taxonomy samples. They were collected in October 2012 following 10 weeks of low flows.

Benthic invertebrates were collected from approximately 1 m^2 of river substrate using a Surber kick net. Invertebrate samples were sorted in the field and stored in glass vials filled with ethanol and stored on ice. In the lab, trays, plastic tweezers and sorting tools were rinsed 3 times in deionized (DI) water between samples. The sorter wore white latex gloves. Benthic invertebrates were rinsed in DI water and sand, caddis cases and organic debris were removed. A quick generalization about the types of invertebrates in the sample was recorded (Table 1). Mussels were shucked and sand, organic debris etc., were removed in DI. The cleaned samples were weighed to the nearest 0.1 g on a Dymo digital scale, placed in labeled plastic bags, refrigerated and delivered to the lab within 24 hours. A total of 7 mussel samples and 6 benthic invertebrate samples were submitted to Caro Labs Kelowna for tissue metals analysis.

At Caro Labs, metals were analyzed using the strong acid leachable method on dried, pulverized tissue material, according to “Standard Methods for the Examination of Water and Wastewater”, 21st Edition, 2005, published by the American Public Health Association (APHA); US EPA protocols found in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846”, 3rd Edition; protocols published by the British Columbia Ministry of Environment (BCMOE); and/or CCME Canada-wide Standard Reference methods.

Table 1. Summary of benthos tissue metal samples collected from the Lower Columbia River in October 2012. Sample Locations are displayed in Figure 1.

Type of Tissue Sample	Site	wet wt. (grams)	Sample Description
ERO-REF-1 BI	Ero-Ref-1	3	Snails, annelids, boatmen, stonefly, mayfly
ERO-REF-2 BI	Ero-Ref-2	5	Caddis, snails, stonefly, mayfly
ERO-EXP-1 BI	Ero-Exp-1	8	Stonefly, mayfly, caddis, snail
ERO-EXP-2 BI	Ero-Exp-2	9	Caddis, snails, stonefly, mayfly
ERO-EXP-3&4 BI	Ero-Exp-3	6	Snail, caddis, stonefly, mayfly, leech
DEP-EXP-7 WAN BI	Dep-Exp-7	4	Snail, boatmen, annelid
ERO-REF-1 Mussel	Ero-Ref-1	20	shucked mussel (rinsed in DI)
ERO-REF-2 Mussel	Ero-Ref-2	25	shucked mussel. (rinsed in DI)
ERO-EXP-1 Mussel	Ero-Exp-1	2	shucked mussel. (rinsed in DI)
DEP-EXP-3 Mussel	Dep-Exp-3	27	shucked mussel. (rinsed in DI)
DEP-EXP-4 Mussel	Dep-Exp-4	13	shucked mussel. (rinsed in DI)
DEP-EXP-5 Mussel	Dep-Exp-5	14	shucked mussel. (rinsed in DI)
DEP-REF-3 Mussel	Dep-Ref-3	16	shucked mussel. (rinsed in DI)

NOTE: Insect cases, sediment and organic debris removed from samples

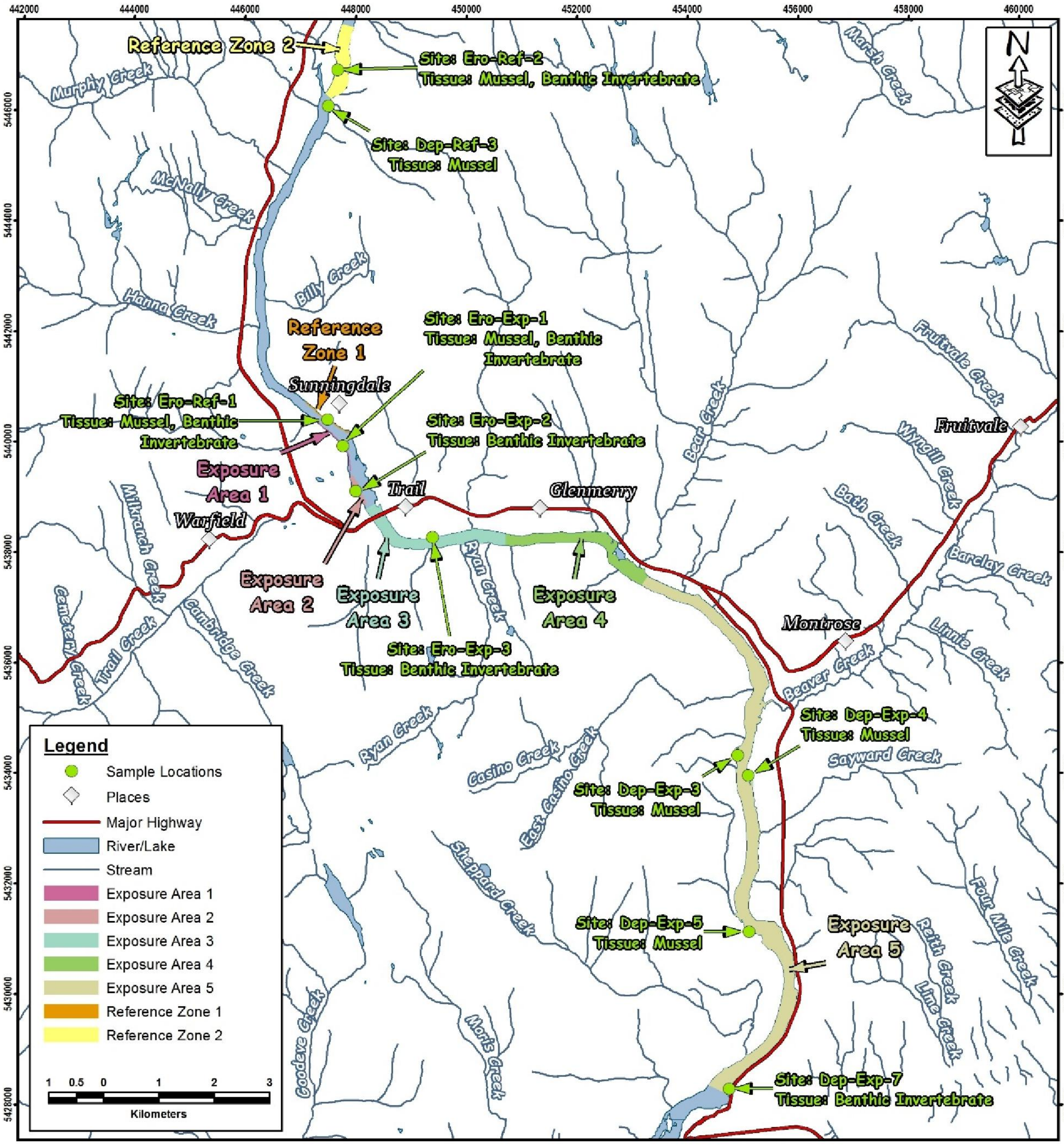

Figure 1. Map of tissue sampling locations

5.0 RESULTS

A total of 13 composite tissue samples were collected from benthic invertebrates and mussels from the reference and exposure sites from the area of interest on the LCR (Figure 1). All results are summarized in Appendix B-1, attached. Table 2 shows the invertebrate tissue results for metals of concern.

Table 2. Invertebrate tissue metals concentrations.

		Arsenic	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
		ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec	ug/g rec
		0.005	0.002	0.01	0.004	0.01	0.004	0.002	0.01	0.02	0.01	0.001	0.5
Ero-Ref-1	Benthic Inverts.	0.302	0.388	0.5	0.2	4.48	0.736	0.008	0.64	0.25	0.05	0.006	11.6
Ero-Ref-2	Benthic Inverts.	0.455	0.249	2.1	0.634	5.96	0.969	0.009	2.62	0.28	0.04	0.017	29.5
Ero-Exp-1	Benthic Inverts.	0.777	0.204	1.2	0.417	4.52	7.61	0.03	1.7	0.25	0.05	0.018	31.4
Ero-Exp-2	Benthic Inverts.	5.05	1.81	7.2	2.25	18.5	85	0.28	8.74	0.86	0.22	0.825	181
ERO-EXP-3	Benthic Inverts.	1.42	0.877	1.6	0.563	50.8	22.8	0.017	1.77	0.34	0.35	0.033	119
Dep-Exp-7	Benthic Inverts.	0.529	0.854	0.5	0.249	38.3	5.18	0.027	0.67	0.43	0.1	0.034	46
Ero-Ref-1	Mussel	0.905	1.8	0.3	0.157	1.71	0.398	0.023	0.29	0.6	0.06	0.004	56.7
Ero-Ref-2	Mussel	1.08	1.14	0.1	0.081	2.39	0.261	0.019	0.15	0.55	0.09	0.003	32.8
Ero-Exp-1	Mussel	0.853	0.936	0.08	0.07	1.31	0.47	0.029	0.16	0.45	0.05	0.005	23.8
Dep-Exp-3	Mussel	1.12	0.601	0.08	0.077	3.33	0.753	0.016	0.08	0.48	0.01	0.016	26.5
Dep-Exp-4	Mussel	1.1	1.52	0.4	0.2	3.56	2	0.021	0.34	0.46	0.06	0.017	70.9
Dep-Exp-5	Mussel	1.45	2.15	0.1	0.148	1.97	1.16	0.027	0.15	0.64	0.03	0.022	22.3
Dep-Ref-3	Mussel	0.865	0.493	0.2	0.082	0.47	0.427	0.015	0.13	0.39	0.02	0.003	21

Benthic invertebrates collected from a site were combined into a composite sample for metals analysis

Table 3. Comparison of benthic invertebrate and mussel tissue samples from Kootenay Eddy (reference), Waneta Eddy (exposure), and Casino Creek eddy (exposure)

	Benthic Invertebrate Tissue (ug/g)		Mussel Tissue (ug/g)	
	Kootenay	Waneta	Kootenay	Casino Creek
Aluminum	186	99	17.9	28
Arsenic	0.302	0.529	0.905	1.223
Cadmium	0.388	0.854	1.80	1.424
Chromium	0.50	0.50	0.30	0.19
Copper	4.48	38.30	1.71	2.95
Lead	0.74	5.18	0.40	1.30
Mercury	0.008	0.027	0.023	0.021
Nickel	0.64	0.67	0.29	0.19
Selenium	0.25	0.43	0.60	0.53
Thallium	0.006	0.034	0.004	0.018
Zinc	11.6	46.0	56.1	39.9
N	1	1	1	3

6.0 CONCLUSIONS

Because invertebrate tissue samples were collected following 10 weeks of low flows and therefore low dilution, these samples should contain metal concentrations in the upper range currently found in the Lower Columbia River.

This small demonstration study of the lower food chain components in the Columbia River provided information useful to the assessment of potential impacts on five wildlife species with river-based diets. Larger sample size would be required to improve the statistical strength.

7.0 CLOSURE

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Any questions pertaining to this report should be directed to Teck Metals Ltd., and the authors of this report.

Respectfully Submitted,
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APPENDIX A

Water Quality Guidelines, Sediment Guidelines, and Tissue Residue Objectives

Appendix A-1. Generalized Water Quality Guidelines and Objectives

Selected Analytes	Units	LCR Water Quality Objectives		BC 2006		CCME
Water Quality General		Maximum	30-day average	Maximum	30-day average	
pH		6.5 - 8.5	-	6.5 - 9.0	-	6.5 - 9.0
Dissolved oxygen	mg/L	5.5 - 9.5	-	5 - 9 (min)	8 - 11 (min)	5.5 - 9.5
Total organic carbon	mg/L	-	-	-	± 20% of median	-
Suspended solids	mg/L	-	-	± 25	± 5	-
Turbidity	NTU	-	-	± 8	± 2	-
Metals						
Aluminum – diss.	mg/L	-	-	-	0.02	-
Arsenic – total	mg/L	-	0.005	0.005	-	0.005
Cadmium – total	mg/L	-	0.00003	Cd calc	-	Cd calc
Chromium – total	mg/L	-	0.001	-	-	-
Chromium III ion	mg/L	-	-	0.009	-	0.0089
Chromium VI ion	mg/L	-	-	0.001	-	0.001
Copper – total	mg/L	0.00717	0.002	Cu calc	-	0.002 - 0.004
Iron – total	mg/L	-	-	0.3	-	0.300
Lead – total	mg/L	0.0379	0.0048	Pb calc	Pb calc	0.001 - 0.007
Mercury – total inorg.	mg/L	-	-	0.0001	0.00002	0.00026
Nickel – total	mg/L	0.0025 - 0.150	-	0.0025 - 0.150	-	0.0025 - 0.150
Selenium – total	mg/L	-	-	-	0.00020	0.0010
Sodium – total	mg/L	-	-	-	-	-
Silver – total	mg/L	-	-	(0.0001 if hardness <100mg/L) - 0.003	0.00005 (hard <100 mg/L) - 0.0015	0.0001
Thallium – total	mg/L	-	0.0008	0.0003	-	0.0008
Zinc – total	mg/L	0.007	-	Zn calc	Zn calc	0.03
Nutrients						
Ammonia as N	mg/L	-	0.102 - 2.08 temp/pH table	0.752 - 27.7 temp/pH table	0.102 - 2.08 temp/pH table	0.019 un-ionized
Nitrate-N as N	mg/L	-	-	200	40	13
Nitrite-N as N	mg/L	-	-	0.06	0.02	0.06
Total phosphorus as P	mg/L	-	-	0.005 - 0.015 for lakes	-	-
Sulphate	mg/L	-	-	(100)	218 calc	-

Parameter/Analyte	Calculation
Cd	$10^{0.86(\log(\text{hardness})-3.2)/1000}$
Cu	0.94(hardness+2)/1000
Pb max	$e^{1.273(\ln(\text{hardness})-1.46)}/1000$
Pb 30 day average	$3.31 + {}_{e}(1.273 \ln(\text{average hardness}) - 4.705)$ in ug/L
SO4 (proposed 2013)	Hardness(mg/L) soft (0-30)=128 (31-75)=218 hard(76-180)=309 very hard(181-250)
Zn max	(33+0.75(hardness-90))/1000
Zn 30 day average	(7.5+0.75(hardness-90))/1000

Water Quality Guideline References

LCR Objectives: Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives, MacDonald Envi Services Ltd. 1997

BC Water Quality Guidelines http://www.env.gov.bc.ca/wat/wq/BCguidelines Nagpal et al 2006

CCME 2005 Canadian Council of Ministers of the Environment f http://st-ts.ccme.ca/

http://www.env.gov.bc.ca/wat/wq/BCguidelines/sulphate/pdf/sulphate_final_guideline.pdf

Appendix A-2. Sediment quality guidelines

Selected Analytes	Units	LCR Sediment	BC Working Guidelines 2006		CCME	
Sediment Quality		Objective	ISQG	PEL	ISQG	PEL
Total Metals	Dry wt.					
Arsenic	mg/kg	5.7	5.9	17	5.9	17
Cadmium	mg/kg	0.6	0.6	3.5	0.6	3.5
Chromium	mg/kg	36.4	37.3	90	37.3	90
Copper	mg/kg	35.1	35.7	197	35.7	197
Iron	mg/kg	-	21,200 (2%)	43,766 (4%)	-	-
Lead	mg/kg	33.4	35	91.3	35	91.3
Mercury	mg/kg	0.16	0.170	0.486	0.17	0.486
Nickel	mg/kg	-	16	75	-	-
Selenium	mg/kg	-	2	-	-	-
Silver	mg/kg	-	0.5(Ontario)	-	-	-
Thallium	mg/kg	-	-	-	-	-
Zinc	mg/kg	120	123	315	123	315

ISQG = interim sediment quality guideline (mg/kg = µg/g)
PEL = possible effects level

NOTE: It is noted here that the Objectives cited here are more stringent than the Contaminated Sites Regulations (CSR) Schedule 9 standards for sediment.
According to the 2009 BC Lab Manual for sediment samples, the < 2 mm fraction is analyzed

Sediment Guideline References

LCR Objectives: Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives, MacDonald Envi Services Ltd. 1997
BC Water Quality Guidelines http://www.env.gov.bc.ca/wat/wq/BCguidelines Nagpal et al 2006
CCME Canadian Council of Ministers of the Environment f http://st-ts.ccme.ca/

Appendix A-3. Tissue metals guidelines for consumers of fish

	Human Health[1]	Wildlife[2]	CCME	BCMOE
Analyte	µg/g	µg/g	µg/g	µg/g
Arsenic	3.5	0.47		
Cadmium		0.9		
Chromium		0.94		
Lead	0.5	0.16		0.08
Mercury	0.5	0.1	0.33	

[1] Canadian guidelines for chemical contaminants and toxins in fish and fish products. Based on fish protein (mussel) concentration (Ammend.no.11, 2011). (Can.Food.Insp.Agency 2011)

[2] LCR tissue residue objectives (TRO): Lower Columbia River from Birchbank to the International Border: Water quality Assessment and Recommended Objectives (MacDonald Envi Services Ltd. 1997)

APPENDIX B

Invertebrate and Mussel Tissue Metals Data

Appendix B-1. Invertebrate tissue metals concentrations.

		SITE	**Ero-Ref-1**	**Ero-Ref-2**	**Ero-Exp-1**	**Ero-Exp-2**	**ERO-EXP-3**	**Dep-Exp-7**	**Ero-Ref-1**	**Ero-Ref-2**	**Ero-Exp-1**	**Dep-Exp-3**	**Dep-Exp-4**	**Dep-Exp-5**	**Dep-Ref-3**
		Type of Sample	Benthic Inverts[1]	Benthic Inverts	Benthic Inverts	Benthic Inverts	Benthic Inverts	Benthic Inverts	Mussel	Mussel	Mussel	Mussel	Mussel	Mussel	Mussel
		DATE SAMPLED	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12	13-Oct-12
Aluminum	ug/g rec	0.4	186	782	469	2300	510	99.3	17.9	6.2	3.2	3.3	76.8	4.3	3.6
Antimony	**ug/g rec**	**0.002**	**0.013**	**0.013**	**0.104**	**0.819**	**2.64**	**0.275**	**0.004**	**0.004**	**0.004**	**0.029**	**0.139**	**0.024**	**0.004**
Arsenic	**ug/g rec**	**0.005**	**0.302**	**0.455**	**0.777**	**5.05**	**1.42**	**0.529**	**0.905**	**1.08**	**0.853**	**1.12**	**1.1**	**1.45**	**0.865**
Barium	ug/g rec	0.01	19.9	16.3	16.4	32.2	18.5	17.6	163	108	28.9	28.6	176	53.8	112
Beryllium	ug/g rec	0.002	0.007	0.029	0.021	0.102	0.018	0.007	0.016	0.006	0.004	<0.002	0.014	0.003	0.008
Bismuth	ug/g rec	0.02	<0.02	<0.02	0.02	0.35	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Boron	ug/g rec	0.2	7	2.8	2.4	1.9	2.9	4.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	**ug/g rec**	**0.002**	**0.388**	**0.249**	**0.204**	**1.81**	**0.877**	**0.854**	**1.8**	**1.14**	**0.936**	**0.601**	**1.52**	**2.15**	**0.493**
Calcium	ug/g rec	2	103000	54800	7950	2230	47900	37700	12100	4440	2540	1270	22100	1410	2290
Chromium	**ug/g rec**	**0.01**	**0.5**	**2.1**	**1.2**	**7.2**	**1.6**	**0.5**	**0.3**	**0.1**	**0.08**	**0.08**	**0.4**	**0.1**	**0.2**
Cobalt	**ug/g rec**	**0.004**	**0.2**	**0.634**	**0.417**	**2.25**	**0.563**	**0.249**	**0.157**	**0.081**	**0.07**	**0.077**	**0.2**	**0.148**	**0.082**
Copper	**ug/g rec**	**0.01**	**4.48**	**5.96**	**4.52**	**18.5**	**50.8**	**38.3**	**1.71**	**2.39**	**1.31**	**3.33**	**3.56**	**1.97**	**0.47**
Iron	**ug/g rec**	**1**	**350**	**1510**	**1010**	**5640**	**1270**	**411**	**272**	**77**	**71**	**244**	**385**	**403**	**1130**
Lead	**ug/g rec**	**0.004**	**0.736**	**0.969**	**7.61**	**85**	**22.8**	**5.18**	**0.398**	**0.261**	**0.47**	**0.753**	**2**	**1.16**	**0.427**
Magnesium	ug/g rec	2	376	680	406	1940	517	283	184	152	161	149	200	123	124
Manganese	ug/g rec	0.02	22	62.4	43.7	256	52.2	21.4	983	541	233	100	1490	163	243
Mercury	**ug/g rec**	**0.002**	**0.008**	**0.009**	**0.03**	**0.28**	**0.017**	**0.027**	**0.023**	**0.019**	**0.029**	**0.016**	**0.021**	**0.027**	**0.015**
Molybdenum	ug/g rec	0.01	0.05	0.1	0.11	0.3	0.13	0.16	0.11	0.1	0.09	0.06	0.09	0.13	0.08
Nickel	**ug/g rec**	**0.01**	**0.64**	**2.62**	**1.7**	**8.74**	**1.77**	**0.67**	**0.29**	**0.15**	**0.16**	**0.08**	**0.34**	**0.15**	**0.13**
Phosphorus	ug/g rec	5	841	1040	894	1520	1160	1200	5830	3510	2600	1340	6150	1630	2200
Potassium	ug/g rec	10	586	749	660	797	824	1100	545	434	445	388	284	323	307
Selenium	**ug/g rec**	**0.02**	**0.25**	**0.28**	**0.25**	**0.86**	**0.34**	**0.43**	**0.6**	**0.55**	**0.45**	**0.48**	**0.46**	**0.64**	**0.39**
Silver	**ug/g rec**	**0.01**	**0.05**	**0.04**	**0.05**	**0.22**	**0.35**	**0.1**	**0.06**	**0.09**	**0.05**	**0.01**	**0.06**	**0.03**	**0.02**
Sodium	ug/g rec	2	929	470	252	98	574	735	250	213	182	125	365	169	170
Strontium	ug/g rec	0.01	138	59.8	13	9.5	61.6	40.7	37.6	17.8	9.2	6.46	57.9	8.97	17.9
Thallium	**ug/g rec**	**0.001**	**0.006**	**0.017**	**0.018**	**0.825**	**0.033**	**0.034**	**0.004**	**0.003**	**0.005**	**0.016**	**0.017**	**0.022**	**0.003**
Tin	ug/g rec	0.02	<0.02	0.03	0.07	0.2	0.4	0.1	<0.02	<0.02	<0.02	<0.02	0.09	<0.02	<0.02
Titanium	ug/g rec	0.05	18.8	75.4	37.6	204	47.7	8.81	0.58	0.31	0.26	0.39	5.01	0.37	0.26
Uranium	ug/g rec	0.001	0.085	0.566	0.274	3.52	0.358	0.156	0.088	0.069	0.053	0.013	0.077	0.034	0.019
Vanadium	ug/g rec	0.02	0.77	3.28	2.28	10.6	2.21	0.51	0.05	0.03	0.03	0.02	0.31	0.04	0.03
Zinc	**ug/g rec**	**0.5**	**11.6**	**29.5**	**31.4**	**181**	**119**	**46**	**56.7**	**32.8**	**23.8**	**26.5**	**70.9**	**22.3**	**21**

Benthic invertebrates collected from a site were combined into a composite sample for metals analysis.

APPENDIX L

LAB QUALITY ASSURANCE AND CONTROL

Project	
Report To	Mark Tinholt, TECK METALS LTD.
ALS File No.	L1215909
Date Received	27-Sep-12 10:50
Date	15-Oct-12

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1215909-4	Water	WG1559106-32	Conductivity	113	113	uS/cm	0.8	10	-	-	-
L1215909-26	Water	WG1559106-33	Conductivity	116	116	uS/cm	0.3	10	-	-	-
L1215909-4	Water	WG1559106-32	pH	8.24	8.20	pH	-	-	0.04	0.2	J
L1215909-26	Water	WG1559106-33	pH	8.23	8.21	pH	-	-	0.02	0.2	J
L1215909-15	Water	WG1557734-12	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1215909-33	Water	WG1557734-15	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1215909-15	Water	WG1557733-12	Total Dissolved Solids	54	51	mg/L	5.1	20	-	-	-
L1215909-6	Water	WG1556293-15	Turbidity	0.37	0.38	NTU	0.5	15	-	-	-
L1215909-15	Water	WG1556435-9	Turbidity	0.55	0.55	NTU	0.2	15	-	-	-
L1215909-30	Water	WG1556435-6	Turbidity	0.68	0.67	NTU	1.2	15	-	-	-
Anions and Nutrients											
L1215909-19	Water	WG1560141-15	Alkalinity, Total (as CaCO3)	48.4	47.7	mg/L	1.3	20	-	-	-
L1215909-27	Water	WG1560650-12	Ammonia, Total (as N)	0.0071	0.0070	mg/L	1.2	20	-	-	-
L1215909-18	Water	WG1558882-3	Bromide (Br)	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1215909-18	Water	WG1558882-3	Chloride (Cl)	0.68	0.68	mg/L	0.0	20	-	-	-
L1215909-18	Water	WG1558882-3	Fluoride (F)	0.099	0.099	mg/L	0.3	20	-	-	-
L1215909-18	Water	WG1558882-3	Nitrate (as N)	0.104	0.103	mg/L	0.9	20	-	-	-
L1215909-18	Water	WG1558882-3	Nitrite (as N)	0.0014	0.0013	mg/L	3.9	20	-	-	-
L1215909-12	Water	WG1558177-6	Total Kjeldahl Nitrogen	0.075	0.082	mg/L	8.6	20	-	-	-
L1215909-10	Water	WG1560952-15	Phosphorus (P)-Total Dissolved	0.0023	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1215909-22	Water	WG1560952-19	Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1215909-10	Water	WG1560952-15	Phosphorus (P)-Total	0.0039	0.0037	mg/L	4.5	20	-	-	-
L1215909-22	Water	WG1560952-19	Phosphorus (P)-Total	0.0042	0.0038	mg/L	9.7	20	-	-	-
L1215909-18	Water	WG1558882-3	Sulfate (SO4)	19.5	19.5	mg/L	0.0	20	-	-	-
Total Metals											
L1215909-1	Water	WG1558346-6	Mercury (Hg)-Total	0.00122	0.00123	ug/L	1.1	20	-	-	-
L1215909-15	Water	WG1559700-4	Mercury (Hg)-Total	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1215909-24	Water	WG1559700-5	Mercury (Hg)-Total	0.00100	0.00100	ug/L	0.0	20	-	-	-
L1215909-29	Water	WG1559700-7	Mercury (Hg)-Total	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
Total Metals (Undigested)											
L1215909-4	Water	WG1556421-3	Aluminum (Al)-Total	0.0153	0.0163	mg/L	6.4	20	-	-	-
L1215909-19	Water	WG1556421-5	Aluminum (Al)-Total	0.0172	0.0156	mg/L	9.3	20	-	-	-
L1215909-4	Water	WG1556421-3	Antimony (Sb)-Total	0.000025	0.000024	mg/L	7.3	20	-	-	-
L1215909-19	Water	WG1556421-5	Antimony (Sb)-Total	0.000025	0.000024	mg/L	3.5	20	-	-	-
L1215909-4	Water	WG1556421-3	Arsenic (As)-Total	0.000163	0.000171	mg/L	4.6	20	-	-	-
L1215909-19	Water	WG1556421-5	Arsenic (As)-Total	0.000172	0.000178	mg/L	3.2	20	-	-	-
L1215909-4	Water	WG1556421-3	Barium (Ba)-Total	0.0164	0.0159	mg/L	2.8	20	-	-	-
L1215909-19	Water	WG1556421-5	Barium (Ba)-Total	0.0163	0.0163	mg/L	0.0	20	-	-	-
L1215909-4	Water	WG1556421-3	Beryllium (Be)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Beryllium (Be)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Bismuth (Bi)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Bismuth (Bi)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Boron (B)-Total	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Boron (B)-Total	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Cadmium (Cd)-Total	0.0000055	0.0000076	mg/L	-	-	0.0000022	0.00001	J
L1215909-19	Water	WG1556421-5	Cadmium (Cd)-Total	0.0000294	0.0000279	mg/L	5.2	20	-	-	-
L1215909-4	Water	WG1556421-3	Calcium (Ca)-Total	17.1	17.0	mg/L	0.4	20	-	-	-
L1215909-19	Water	WG1556421-5	Calcium (Ca)-Total	17.1	17.5	mg/L	2.0	20	-	-	-
L1215909-4	Water	WG1556421-3	Chromium (Cr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Chromium (Cr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Cobalt (Co)-Total	0.0000131	0.0000125	mg/L	4.9	20	-	-	-
L1215909-19	Water	WG1556421-5	Cobalt (Co)-Total	0.0000148	0.0000139	mg/L	5.8	20	-	-	-
L1215909-4	Water	WG1556421-3	Copper (Cu)-Total	0.00033	0.00035	mg/L	6.1	20	-	-	-
L1215909-19	Water	WG1556421-5	Copper (Cu)-Total	0.00030	0.00029	mg/L	5.4	20	-	-	-
L1215909-4	Water	WG1556421-3	Iron (Fe)-Total	0.0105	0.0103	mg/L	1.9	20	-	-	-
L1215909-19	Water	WG1556421-5	Iron (Fe)-Total	0.0098	0.0098	mg/L	0.1	20	-	-	-
L1215909-4	Water	WG1556421-3	Lead (Pb)-Total	0.0000455	0.0000443	mg/L	2.5	20	-	-	-
L1215909-19	Water	WG1556421-5	Lead (Pb)-Total	0.0000464	0.0000470	mg/L	1.4	20	-	-	-
L1215909-4	Water	WG1556421-3	Lithium (Li)-Total	0.00084	0.00097	mg/L	15	20	-	-	-
L1215909-19	Water	WG1556421-5	Lithium (Li)-Total	0.00067	0.00065	mg/L	2.2	20	-	-	-
L1215909-4	Water	WG1556421-3	Magnesium (Mg)-Total	3.68	3.68	mg/L	0.1	20	-	-	-
L1215909-19	Water	WG1556421-5	Magnesium (Mg)-Total	3.65	3.73	mg/L	2.3	20	-	-	-
L1215909-4	Water	WG1556421-3	Manganese (Mn)-Total	0.00196	0.00215	mg/L	9.2	20	-	-	-
L1215909-19	Water	WG1556421-5	Manganese (Mn)-Total	0.00214	0.00218	mg/L	1.7	20	-	-	-
L1215909-4	Water	WG1556421-3	Molybdenum (Mo)-Total	0.000505	0.000511	mg/L	1.1	20	-	-	-
L1215909-19	Water	WG1556421-5	Molybdenum (Mo)-Total	0.000455	0.000468	mg/L	2.8	20	-	-	-
L1215909-4	Water	WG1556421-3	Nickel (Ni)-Total	0.000357	0.000357	mg/L	0.1	20	-	-	-
L1215909-19	Water	WG1556421-5	Nickel (Ni)-Total	0.000344	0.000340	mg/L	1.3	20	-	-	-
L1215909-4	Water	WG1556421-3	Phosphorus (P)-Total	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Phosphorus (P)-Total	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Potassium (K)-Total	0.675	0.653	mg/L	3.3	20	-	-	-
L1215909-19	Water	WG1556421-5	Potassium (K)-Total	0.701	0.689	mg/L	1.7	20	-	-	-
L1215909-4	Water	WG1556421-3	Selenium (Se)-Total	0.000156	0.000169	mg/L	8.2	20	-	-	-
L1215909-19	Water	WG1556421-5	Selenium (Se)-Total	0.000167	0.000164	mg/L	1.7	20	-	-	-
L1215909-4	Water	WG1556421-3	Silicon (Si)-Total	1.65	1.65	mg/L	0.5	20	-	-	-
L1215909-19	Water	WG1556421-5	Silicon (Si)-Total	1.61	1.64	mg/L	1.9	20	-	-	-
L1215909-4	Water	WG1556421-3	Silver (Ag)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Silver (Ag)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Sodium (Na)-Total	1.08	1.09	mg/L	0.5	20	-	-	-
L1215909-19	Water	WG1556421-5	Sodium (Na)-Total	1.08	1.14	mg/L	5.4	20	-	-	-

L1215909-4	Water	WG1556421-3	Strontium (Sr)-Total	0.0941	0.0951	mg/L	1.1	20	-	-	-
L1215909-19	Water	WG1556421-5	Strontium (Sr)-Total	0.0925	0.0927	mg/L	0.2	20	-	-	-
L1215909-4	Water	WG1556421-3	Thallium (Tl)-Total	0.0000035	0.0000033	mg/L	7.7	20	-	-	-
L1215909-19	Water	WG1556421-5	Thallium (Tl)-Total	0.0000040	0.0000042	mg/L	4.7	20	-	-	-
L1215909-4	Water	WG1556421-3	Tin (Sn)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Tin (Sn)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Titanium (Ti)-Total	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Titanium (Ti)-Total	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1215909-4	Water	WG1556421-3	Uranium (U)-Total	0.000364	0.000374	mg/L	2.7	20	-	-	-
L1215909-19	Water	WG1556421-5	Uranium (U)-Total	0.000352	0.000365	mg/L	3.6	20	-	-	-
L1215909-4	Water	WG1556421-3	Vanadium (V)-Total	0.000119	0.000119	mg/L	0.4	20	-	-	-
L1215909-19	Water	WG1556421-5	Vanadium (V)-Total	0.000122	0.000125	mg/L	2.3	20	-	-	-
L1215909-4	Water	WG1556421-3	Zinc (Zn)-Total	0.00259	0.00229	mg/L	12	20	-	-	-
L1215909-19	Water	WG1556421-5	Zinc (Zn)-Total	0.00144	0.00142	mg/L	1.6	20	-	-	-
L1215909-4	Water	WG1556421-3	Zirconium (Zr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-19	Water	WG1556421-5	Zirconium (Zr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
Dissolved Metals											
L1215909-5	Water	WG1556418-6	Aluminum (Al)-Dissolved	0.00928	0.0103	mg/L	10	20	-	-	-
L1215909-27	Water	WG1556418-8	Aluminum (Al)-Dissolved	0.0103	0.00951	mg/L	8.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Antimony (Sb)-Dissolved	0.000029	0.000027	mg/L	9.0	20	-	-	-
L1215909-27	Water	WG1556418-8	Antimony (Sb)-Dissolved	0.000026	0.000023	mg/L	11	20	-	-	-
L1215909-5	Water	WG1556418-6	Arsenic (As)-Dissolved	0.000172	0.000169	mg/L	1.6	20	-	-	-
L1215909-27	Water	WG1556418-8	Arsenic (As)-Dissolved	0.000157	0.000169	mg/L	7.4	20	-	-	-
L1215909-5	Water	WG1556418-6	Barium (Ba)-Dissolved	0.0153	0.0153	mg/L	0.3	20	-	-	-
L1215909-27	Water	WG1556418-8	Barium (Ba)-Dissolved	0.0158	0.0156	mg/L	1.2	20	-	-	-
L1215909-5	Water	WG1556418-6	Beryllium (Be)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Beryllium (Be)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Boron (B)-Dissolved	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Boron (B)-Dissolved	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Cadmium (Cd)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Cadmium (Cd)-Dissolved	0.0000064	0.0000065	mg/L	1.6	20	-	-	-
L1215909-5	Water	WG1556418-6	Calcium (Ca)-Dissolved	17.3	17.5	mg/L	1.2	20	-	-	-
L1215909-27	Water	WG1556418-8	Calcium (Ca)-Dissolved	17.3	17.4	mg/L	0.6	20	-	-	-
L1215909-5	Water	WG1556418-6	Chromium (Cr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Chromium (Cr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Cobalt (Co)-Dissolved	0.0000103	0.0000058	mg/L	-	-	0.0000045	0.00001	J
L1215909-27	Water	WG1556418-8	Cobalt (Co)-Dissolved	0.0000067	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Copper (Cu)-Dissolved	0.00025	0.00026	mg/L	2.2	20	-	-	-
L1215909-27	Water	WG1556418-8	Copper (Cu)-Dissolved	0.00022	0.00022	mg/L	0.7	20	-	-	-
L1215909-5	Water	WG1556418-6	Iron (Fe)-Dissolved	0.0017	0.0017	mg/L	0.6	20	-	-	-
L1215909-27	Water	WG1556418-8	Iron (Fe)-Dissolved	0.0016	0.0015	mg/L	4.4	20	-	-	-
L1215909-5	Water	WG1556418-6	Lead (Pb)-Dissolved	0.0000095	0.0000109	mg/L	13	20	-	-	-
L1215909-27	Water	WG1556418-8	Lead (Pb)-Dissolved	0.0000207	0.0000198	mg/L	4.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Lithium (Li)-Dissolved	0.00085	0.00091	mg/L	7.3	20	-	-	-
L1215909-27	Water	WG1556418-8	Lithium (Li)-Dissolved	0.00075	0.00094	mg/L	-	-	0.00019	0.001	J
L1215909-5	Water	WG1556418-6	Magnesium (Mg)-Dissolved	3.66	3.71	mg/L	1.4	20	-	-	-
L1215909-27	Water	WG1556418-8	Magnesium (Mg)-Dissolved	3.63	3.69	mg/L	1.6	20	-	-	-
L1215909-5	Water	WG1556418-6	Manganese (Mn)-Dissolved	0.000634	0.000668	mg/L	5.1	20	-	-	-
L1215909-27	Water	WG1556418-8	Manganese (Mn)-Dissolved	0.000817	0.000773	mg/L	5.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Molybdenum (Mo)-Dissolved	0.000496	0.000508	mg/L	2.3	20	-	-	-
L1215909-27	Water	WG1556418-8	Molybdenum (Mo)-Dissolved	0.000486	0.000481	mg/L	1.1	20	-	-	-
L1215909-5	Water	WG1556418-6	Nickel (Ni)-Dissolved	0.000320	0.000307	mg/L	4.1	20	-	-	-
L1215909-27	Water	WG1556418-8	Nickel (Ni)-Dissolved	0.000315	0.000295	mg/L	6.6	20	-	-	-
L1215909-5	Water	WG1556418-6	Phosphorus (P)-Dissolved	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Phosphorus (P)-Dissolved	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Potassium (K)-Dissolved	0.680	0.673	mg/L	0.9	20	-	-	-
L1215909-27	Water	WG1556418-8	Potassium (K)-Dissolved	0.658	0.672	mg/L	2.1	20	-	-	-
L1215909-5	Water	WG1556418-6	Selenium (Se)-Dissolved	0.000156	0.000162	mg/L	4.1	20	-	-	-
L1215909-27	Water	WG1556418-8	Selenium (Se)-Dissolved	0.000160	0.000174	mg/L	8.6	20	-	-	-
L1215909-5	Water	WG1556418-6	Silicon (Si)-Dissolved	1.59	1.62	mg/L	1.4	20	-	-	-
L1215909-27	Water	WG1556418-8	Silicon (Si)-Dissolved	1.56	1.58	mg/L	1.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Silver (Ag)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Silver (Ag)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Sodium (Na)-Dissolved	1.05	1.08	mg/L	2.6	20	-	-	-
L1215909-27	Water	WG1556418-8	Sodium (Na)-Dissolved	1.12	1.10	mg/L	2.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Strontium (Sr)-Dissolved	0.0970	0.0930	mg/L	4.3	20	-	-	-
L1215909-27	Water	WG1556418-8	Strontium (Sr)-Dissolved	0.0911	0.0938	mg/L	3.0	20	-	-	-
L1215909-5	Water	WG1556418-6	Thallium (Tl)-Dissolved	0.0000035	0.0000032	mg/L	11	20	-	-	-
L1215909-27	Water	WG1556418-8	Thallium (Tl)-Dissolved	0.0000033	0.0000037	mg/L	9.5	20	-	-	-
L1215909-5	Water	WG1556418-6	Tin (Sn)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Tin (Sn)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Titanium (Ti)-Dissolved	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Titanium (Ti)-Dissolved	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1215909-5	Water	WG1556418-6	Uranium (U)-Dissolved	0.000368	0.000361	mg/L	1.9	20	-	-	-
L1215909-27	Water	WG1556418-8	Uranium (U)-Dissolved	0.000365	0.000369	mg/L	1.0	20	-	-	-
L1215909-5	Water	WG1556418-6	Vanadium (V)-Dissolved	0.000121	0.000108	mg/L	12	20	-	-	-
L1215909-27	Water	WG1556418-8	Vanadium (V)-Dissolved	0.000108	0.000109	mg/L	0.9	20	-	-	-
L1215909-5	Water	WG1556418-6	Zinc (Zn)-Dissolved	0.00152	0.00121	mg/L	-	-	0.00031	0.001	J
L1215909-27	Water	WG1556418-8	Zinc (Zn)-Dissolved	0.00112	0.00111	mg/L	1.4	20	-	-	-
L1215909-5	Water	WG1556418-6	Zirconium (Zr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1215909-27	Water	WG1556418-8	Zirconium (Zr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
Physical Tests											
L1215909-33	Water	WG1557733-15	Total Dissolved Solids	65	63	mg/L	4.2	20	-	-	-

Project	
Report To	Mark Tinholt, TECK METALS LTD.
ALS File No.	L1215909
Date Received	27-Sep-12 10:50
Date	15-Oct-12

QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1556293-2	VA-TURB-SPK-8	8.03	8.00	NTU	100.4	85-115	
Water	CRM	Turbidity	WG1556293-5	VA-TURB-SPK-8	8.00	8.00	NTU	100.0	85-115	
Water	CRM	Turbidity	WG1556293-8	VA-TURB-SPK-8	8.00	8.00	NTU	100.0	85-115	
Water	CRM	Turbidity	WG1556435-2	VA-TURB-SPK-8	8.27	8.00	NTU	103.4	85-115	
Water	CRM	Turbidity	WG1556435-5	VA-TURB-SPK-8	8.38	8.00	NTU	104.8	85-115	
Water	CRM	Turbidity	WG1556435-8	VA-TURB-SPK-8	8.55	8.00	NTU	106.9	85-115	
Water	CRM	pH	WG1560673-1	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	Turbidity	WG1556293-11	VA-TURB-SPK-8	8.25	8.00	NTU	103.1	85-115	
Water	CRM	Turbidity	WG1556293-14	VA-TURB-SPK-8	8.19	8.00	NTU	102.4	85-115	
Water	CRM	Turbidity	WG1556435-11	VA-TURB-SPK-8	8.40	8.00	NTU	105.0	85-115	
Water	CRM	Turbidity	WG1556435-14	VA-TURB-SPK-8	8.35	8.00	NTU	104.4	85-115	
Water	CRM	Turbidity	WG1556435-17	VA-TURB-SPK-8	8.31	8.00	NTU	103.9	85-115	
Water	CRM	Conductivity	WG1559106-17	VA-EC-PCT-CONTROL	146	147	uS/cm	99.5	90-110	
Water	CRM	Conductivity	WG1559106-18	VA-EC-PCT-CONTROL	141	147	uS/cm	95.9	90-110	
Water	CRM	Conductivity	WG1559106-19	VA-EC-PCT-CONTROL	143	147	uS/cm	97.3	90-110	
Water	CRM	Conductivity	WG1559106-20	VA-EC-PCT-CONTROL	144	147	uS/cm	98.0	90-110	
Water	CRM	Conductivity	WG1559106-21	VA-EC-PCT-CONTROL	144	147	uS/cm	98.1	90-110	
Water	CRM	Conductivity	WG1559106-22	VA-EC-PCT-CONTROL	145	147	uS/cm	98.4	90-110	
Water	CRM	Conductivity	WG1559106-23	VA-EC-PCT-CONTROL	145	147	uS/cm	98.5	90-110	
Water	CRM	pH	WG1559106-24	VA-PH7-BUF	6.99	7.00	pH	6.99	6.9-7.1	
Water	CRM	pH	WG1559106-25	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1559106-26	VA-PH7-BUF	7.00	7.00	pH	7.00	6.9-7.1	
Water	CRM	pH	WG1559106-27	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1559106-28	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1559106-29	VA-PH7-BUF	7.00	7.00	pH	7.00	6.9-7.1	
Water	CRM	pH	WG1559106-30	VA-PH7-BUF	6.99	7.00	pH	6.99	6.9-7.1	
Water	LCS	Total Dissolved Solids	WG1557733-2		433	425	mg/L	101.9	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-5		429	425	mg/L	100.9	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-8		423	425	mg/L	99.5	85-115	
Water	LCS	Total Suspended Solids	WG1557734-2		69.8	75.0	mg/L	93.1	85-115	
Water	LCS	Total Suspended Solids	WG1557734-5		70.5	75.0	mg/L	94.0	85-115	
Water	LCS	Total Suspended Solids	WG1557734-8		67.6	75.0	mg/L	90.1	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-11		437	425	mg/L	102.8	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-14		430	425	mg/L	101.2	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-17		428	425	mg/L	100.7	85-115	
Water	LCS	Total Dissolved Solids	WG1557733-20		428	425	mg/L	100.7	85-115	
Water	LCS	Total Suspended Solids	WG1557734-11		71.2	75.0	mg/L	94.9	85-115	
Water	LCS	Total Suspended Solids	WG1557734-14		71.2	75.0	mg/L	94.9	85-115	
Water	LCS	Total Suspended Solids	WG1557734-17		71.1	75.0	mg/L	94.8	85-115	
Water	LCS	Total Suspended Solids	WG1557734-20		69.5	75.0	mg/L	92.7	85-115	
Water	MB	Turbidity	WG1556293-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556293-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556293-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1557733-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1557733-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1557733-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1557734-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1557734-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1557734-7		<3.0	<3	mg/L	-	3	
Water	MB	Conductivity	WG1559106-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-7		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1559106-8		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1556293-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556293-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1556435-16		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1557733-10		<10	<10	mg/L	-	10	

Water	MB	Total Dissolved Solids	WG1557733-13		<10	<10	mg/L	-	10
Water	MB	Total Dissolved Solids	WG1557733-16		<10	<10	mg/L	-	10
Water	MB	Total Dissolved Solids	WG1557733-19		<10	<10	mg/L	-	10
Water	MB	Total Suspended Solids	WG1557734-10		<3.0	<3	mg/L	-	3
Water	MB	Total Suspended Solids	WG1557734-13		<3.0	<3	mg/L	-	3
Water	MB	Total Suspended Solids	WG1557734-16		<3.0	<3	mg/L	-	3
Water	MB	Total Suspended Solids	WG1557734-19		<3.0	<3	mg/L	-	3
Anions and Nutrients									
Water	CRM	Alkalinity, Total (as CaCO3)	WG1560141-2	VA-ALKL-CONTROL	14.4	15.0	mg/L	96.0	85-115
Water	CRM	Alkalinity, Total (as CaCO3)	WG1560141-5	VA-ALKM-CONTROL	78.5	75.0	mg/L	104.7	85-115
Water	CRM	Alkalinity, Total (as CaCO3)	WG1560141-8	VA-ALKH-CONTROL	260	250	mg/L	103.9	85-115
Water	CRM	Ammonia, Total (as N)	WG1560650-2	VA-NH3-F	0.119	0.120	mg/L	99.2	85-115
Water	CRM	Ammonia, Total (as N)	WG1560650-4	VA-NH3-F	0.119	0.120	mg/L	99.1	85-115
Water	CRM	Ammonia, Total (as N)	WG1560650-6	VA-NH3-F	0.113	0.120	mg/L	94.2	85-115
Water	CRM	Ammonia, Total (as N)	WG1560650-8	VA-NH3-F	0.113	0.120	mg/L	94.0	85-115
Water	CRM	Phosphorus (P)-Total Dissolved	WG1560952-2	VA-ERA-PO4	4.03	3.99	mg/L	101.0	80-120
Water	CRM	Phosphorus (P)-Total	WG1560952-2	VA-ERA-PO4	4.16	3.99	mg/L	104.3	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1560952-6	VA-ERA-PO4	4.02	3.99	mg/L	100.8	80-120
Water	CRM	Phosphorus (P)-Total	WG1560952-6	VA-ERA-PO4	4.06	3.99	mg/L	101.9	80-120
Water	CRM	Ammonia, Total (as N)	WG1561492-2	VA-NH3-F	0.113	0.120	mg/L	94.3	85-115
Water	CRM	Ammonia, Total (as N)	WG1561492-4	VA-NH3-F	0.111	0.120	mg/L	92.3	85-115
Water	CRM	Ammonia, Total (as N)	WG1561492-6	VA-NH3-F	0.113	0.120	mg/L	93.9	85-115
Water	CRM	Ammonia, Total (as N)	WG1561492-8	VA-NH3-F	0.113	0.120	mg/L	94.2	85-115
Water	CRM	Ammonia, Total (as N)	WG1560650-10	VA-NH3-F	0.115	0.120	mg/L	95.5	85-115
Water	CRM	Phosphorus (P)-Total Dissolved	WG1560952-10	VA-ERA-PO4	3.98	3.99	mg/L	99.7	80-120
Water	CRM	Phosphorus (P)-Total	WG1560952-10	VA-ERA-PO4	4.02	3.99	mg/L	100.8	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1560952-14	VA-ERA-PO4	4.17	3.99	mg/L	104.4	80-120
Water	CRM	Phosphorus (P)-Total	WG1560952-14	VA-ERA-PO4	4.06	3.99	mg/L	101.7	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1560952-18	VA-ERA-PO4	4.15	3.99	mg/L	103.9	80-120
Water	CRM	Phosphorus (P)-Total	WG1560952-18	VA-ERA-PO4	4.15	3.99	mg/L	104.1	80-120
Water	CRM	Ammonia, Total (as N)	WG1561492-10	VA-NH3-F	0.113	0.120	mg/L	93.8	85-115
Water	CRM	Ammonia, Total (as N)	WG1561492-12	VA-NH3-F	0.112	0.120	mg/L	93.6	85-115
Water	CRM	Ammonia, Total (as N)	WG1561492-14	VA-NH3-F	0.111	0.120	mg/L	92.4	85-115
Water	LCS	Total Kjeldahl Nitrogen	WG1558177-2		0.965	1.00	mg/L	96.5	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1558177-5		0.913	1.00	mg/L	91.3	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1558736-2		1.03	1.00	mg/L	102.8	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1558736-5		1.02	1.00	mg/L	101.8	75-125
Water	LCS	Bromide (Br)	WG1558882-2		0.504	0.500	mg/L	100.9	85-115
Water	LCS	Chloride (Cl)	WG1558882-2		101	100	mg/L	101.3	85-115
Water	LCS	Fluoride (F)	WG1558882-2		1.05	1.00	mg/L	105.4	85-115
Water	LCS	Nitrate (as N)	WG1558882-2		2.57	2.50	mg/L	102.8	85-115
Water	LCS	Nitrite (as N)	WG1558882-2		0.502	0.500	mg/L	100.4	85-115
Water	LCS	Sulfate (SO4)	WG1558882-2		104	100	mg/L	103.7	85-115
Water	LCS	Bromide (Br)	WG1558882-12		0.468	0.500	mg/L	93.5	85-115
Water	LCS	Chloride (Cl)	WG1558882-12		101	100	mg/L	100.7	85-115
Water	LCS	Fluoride (F)	WG1558882-12		1.05	1.00	mg/L	104.7	85-115
Water	LCS	Nitrate (as N)	WG1558882-12		2.55	2.50	mg/L	102.0	85-115
Water	LCS	Nitrite (as N)	WG1558882-12		0.495	0.500	mg/L	99.0	85-115
Water	LCS	Sulfate (SO4)	WG1558882-12		103	100	mg/L	103.0	85-115
Water	MB	Total Kjeldahl Nitrogen	WG1558177-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1558177-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1558736-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1558736-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Bromide (Br)	WG1558882-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1558882-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1558882-1		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1558882-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1558882-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1558882-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1558882-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1558882-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1558882-4		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1558882-4		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1558882-4		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1558882-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1558882-7		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1558882-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1558882-7		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1558882-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1558882-7		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1558882-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Alkalinity, Total (as CaCO3)	WG1560141-1		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1560141-4		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1560141-7		<2.0	<2	mg/L	-	2
Water	MB	Ammonia, Total (as N)	WG1560650-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1560650-3		<0.0050	<0.005	mg/L	-	0.005

Water	MB	Ammonia, Total (as N)	WG1560650-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1560650-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1560650-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Phosphorus (P)-Total Dissolved	WG1560952-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1560952-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1560952-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1560952-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1560952-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1560952-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Ammonia, Total (as N)	WG1561492-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1561492-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1561492-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1561492-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1561492-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Bromide (Br)	WG1558882-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1558882-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1558882-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1558882-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1558882-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1558882-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1560952-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1560952-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1560952-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1560952-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Ammonia, Total (as N)	WG1561492-11		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1561492-13		<0.0050	<0.005	mg/L	-	0.005	

Water	MS	Bromide (Br)	WG1558882-5	L1215909-12	0.463	0.500	mg/L	92.6	75-125	
Water	MS	Chloride (Cl)	WG1558882-5	L1215909-12	99.7	100	mg/L	99.7	75-125	
Water	MS	Fluoride (F)	WG1558882-5	L1215909-12	1.10	1.06	mg/L	104.0	75-125	
Water	MS	Nitrate (as N)	WG1558882-5	L1215909-12	2.59	2.58	mg/L	100.3	75-125	
Water	MS	Nitrite (as N)	WG1558882-5	L1215909-12	0.487	0.501	mg/L	97.2	75-125	
Water	MS	Sulfate (SO4)	WG1558882-5	L1215909-12	109	109	mg/L	100.2	75-125	
Water	MS	Bromide (Br)	WG1558882-8	L1215909-25	0.461	0.500	mg/L	92.1	75-125	
Water	MS	Chloride (Cl)	WG1558882-8	L1215909-25	99.2	100	mg/L	99.2	75-125	
Water	MS	Fluoride (F)	WG1558882-8	L1215909-25	1.09	1.06	mg/L	103.7	75-125	
Water	MS	Nitrate (as N)	WG1558882-8	L1215909-25	2.58	2.58	mg/L	99.8	75-125	
Water	MS	Nitrite (as N)	WG1558882-8	L1215909-25	0.482	0.500	mg/L	96.3	75-125	
Water	MS	Sulfate (SO4)	WG1558882-8	L1215909-25	109	109	mg/L	99.8	75-125	
Water	MS	Phosphorus (P)-Total	WG1560952-4	Anonymous	0.0565	0.0619	mg/L	89.1	70-130	
Water	MS	Phosphorus (P)-Total	WG1560952-8	Anonymous	0.101	0.117	mg/L	N/A	-	MS-B
Water	MS	Bromide (Br)	WG1558882-11	L1215909-34	0.470	0.500	mg/L	93.9	75-125	
Water	MS	Chloride (Cl)	WG1558882-11	L1215909-34	100	100	mg/L	100.2	75-125	
Water	MS	Fluoride (F)	WG1558882-11	L1215909-34	1.10	1.06	mg/L	104.8	75-125	
Water	MS	Nitrate (as N)	WG1558882-11	L1215909-34	2.60	2.58	mg/L	100.7	75-125	
Water	MS	Nitrite (as N)	WG1558882-11	L1215909-34	0.485	0.501	mg/L	96.9	75-125	
Water	MS	Sulfate (SO4)	WG1558882-11	L1215909-34	110	109	mg/L	100.8	75-125	
Water	MS	Ammonia, Total (as N)	WG1560650-11	L1215909-6	0.185	0.206	mg/L	89.7	75-125	
Water	MS	Ammonia, Total (as N)	WG1560650-13	L1215909-27	0.189	0.207	mg/L	91.1	75-125	
Water	MS	Phosphorus (P)-Total	WG1560952-12	Anonymous	0.0738	0.0671	mg/L	113.4	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1560952-16	L1215909-11	0.0471	0.0500	mg/L	94.1	70-130	
Water	MS	Phosphorus (P)-Total	WG1560952-16	L1215909-11	0.0487	0.0540	mg/L	89.3	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1560952-20	L1215909-23	0.0516	0.0500	mg/L	103.2	70-130	
Water	MS	Phosphorus (P)-Total	WG1560952-20	L1215909-23	0.0505	0.0543	mg/L	92.4	70-130	
Water	MS	Ammonia, Total (as N)	WG1561492-16	Anonymous	0.475	0.507	mg/L	N/A	-	MS-B
Water	MS	Ammonia, Total (as N)	WG1561492-18	Anonymous	0.178	0.208	mg/L	85.3	75-125	
Water	MS	Ammonia, Total (as N)	WG1561492-20	Anonymous	0.251	0.275	mg/L	88.3	75-125	

Total Metals

Water	LCS	Mercury (Hg)-Total	WG1559700-2	VA-HG-L-WATRM	0.00500	0.00500	ug/L	100.0	80-120
Water	LCS	Mercury (Hg)-Total	WG1561409-2	VA-HG-L-WATRM	0.00502	0.00500	ug/L	100.4	80-120

Water	MB	Mercury (Hg)-Total	WG1559700-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Total	WG1561409-1		<0.00050	<0.0005	ug/L	-	0.0005

Water	MS	Mercury (Hg)-Total	WG1558346-4	Anonymous	0.00526	0.00500	ug/L	105.1	70-130
Water	MS	Mercury (Hg)-Total	WG1558346-5	Anonymous	0.00412	0.00500	ug/L	82.3	70-130
Water	MS	Mercury (Hg)-Total	WG1558346-7	L1215909-2	0.00512	0.00500	ug/L	102.4	70-130
Water	MS	Mercury (Hg)-Total	WG1559700-3	L1215909-13	0.00500	0.00500	ug/L	100.0	70-130
Water	MS	Mercury (Hg)-Total	WG1559700-6	L1215909-26	0.00600	0.00600	ug/L	100.0	70-130
Water	MS	Mercury (Hg)-Total	WG1561409-3	L1215909-35	0.00530	0.00500	ug/L	106.0	70-130
Water	MS	Mercury (Hg)-Total	WG1561409-5	L1215909-30	0.00503	0.00500	ug/L	100.6	70-130
Water	MS	Mercury (Hg)-Total	WG1561409-6	Anonymous	0.00539	0.00555	ug/L	96.8	70-130
Water	MS	Mercury (Hg)-Total	WG1561409-8	Anonymous	0.00800	0.00890	ug/L	82.0	70-130
Water	MS	Mercury (Hg)-Total	WG1561409-9	Anonymous	0.00429	0.00550	ug/L	75.8	70-130

Total Metals (Undigested)

Water	CRM	Aluminum (Al)-Total	WG1556421-2	VA-HIGH-WATRM	2.03	2.00	mg/L	101.4	80-120
Water	CRM	Antimony (Sb)-Total	WG1556421-2	VA-HIGH-WATRM	1.02	1.00	mg/L	101.6	80-120

Water	CRM	Arsenic (As)-Total	WG1556421-2	VA-HIGH-WATRM	0.981	1.00	mg/L	98.1	80-120
Water	CRM	Barium (Ba)-Total	WG1556421-2	VA-HIGH-WATRM	0.252	0.250	mg/L	100.7	80-120
Water	CRM	Beryllium (Be)-Total	WG1556421-2	VA-HIGH-WATRM	0.105	0.100	mg/L	104.5	80-120
Water	CRM	Bismuth (Bi)-Total	WG1556421-2	VA-HIGH-WATRM	0.935	1.00	mg/L	93.5	80-120
Water	CRM	Boron (B)-Total	WG1556421-2	VA-HIGH-WATRM	1.04	1.00	mg/L	103.7	80-120
Water	CRM	Cadmium (Cd)-Total	WG1556421-2	VA-HIGH-WATRM	0.101	0.100	mg/L	100.6	80-120
Water	CRM	Calcium (Ca)-Total	WG1556421-2	VA-HIGH-WATRM	51.0	50.0	mg/L	102.0	80-120
Water	CRM	Chromium (Cr)-Total	WG1556421-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.0	80-120
Water	CRM	Cobalt (Co)-Total	WG1556421-2	VA-HIGH-WATRM	0.242	0.250	mg/L	96.8	80-120
Water	CRM	Copper (Cu)-Total	WG1556421-2	VA-HIGH-WATRM	0.237	0.250	mg/L	95.0	80-120
Water	CRM	Iron (Fe)-Total	WG1556421-2	VA-HIGH-WATRM	0.969	1.00	mg/L	96.9	80-120
Water	CRM	Lead (Pb)-Total	WG1556421-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.2	80-120
Water	CRM	Lithium (Li)-Total	WG1556421-2	VA-HIGH-WATRM	0.274	0.250	mg/L	109.5	80-120
Water	CRM	Magnesium (Mg)-Total	WG1556421-2	VA-HIGH-WATRM	51.0	50.0	mg/L	102.1	80-120
Water	CRM	Manganese (Mn)-Total	WG1556421-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.0	80-120
Water	CRM	Molybdenum (Mo)-Total	WG1556421-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.5	80-120
Water	CRM	Nickel (Ni)-Total	WG1556421-2	VA-HIGH-WATRM	0.482	0.500	mg/L	96.4	80-120
Water	CRM	Phosphorus (P)-Total	WG1556421-2	VA-HIGH-WATRM	2.50	2.50	mg/L	100.0	80-120
Water	CRM	Potassium (K)-Total	WG1556421-2	VA-HIGH-WATRM	50.5	50.0	mg/L	101.0	80-120
Water	CRM	Selenium (Se)-Total	WG1556421-2	VA-HIGH-WATRM	0.980	1.00	mg/L	98.0	80-120
Water	CRM	Silicon (Si)-Total	WG1556421-2	VA-HIGH-WATRM	0.981	1.00	mg/L	98.1	80-120
Water	CRM	Silver (Ag)-Total	WG1556421-2	VA-HIGH-WATRM	0.103	0.100	mg/L	102.5	80-120
Water	CRM	Sodium (Na)-Total	WG1556421-2	VA-HIGH-WATRM	52.8	50.0	mg/L	105.6	80-120
Water	CRM	Strontium (Sr)-Total	WG1556421-2	VA-HIGH-WATRM	0.236	0.250	mg/L	94.4	80-120
Water	CRM	Thallium (Tl)-Total	WG1556421-2	VA-HIGH-WATRM	0.994	1.00	mg/L	99.4	80-120
Water	CRM	Tin (Sn)-Total	WG1556421-2	VA-HIGH-WATRM	0.504	0.500	mg/L	100.8	80-120
Water	CRM	Titanium (Ti)-Total	WG1556421-2	VA-HIGH-WATRM	0.237	0.250	mg/L	94.7	80-120
Water	CRM	Uranium (U)-Total	WG1556421-2	VA-HIGH-WATRM	0.00481	0.00500	mg/L	96.2	80-120
Water	CRM	Vanadium (V)-Total	WG1556421-2	VA-HIGH-WATRM	0.499	0.500	mg/L	99.8	80-120
Water	CRM	Zinc (Zn)-Total	WG1556421-2	VA-HIGH-WATRM	0.475	0.500	mg/L	94.9	80-120
Water	CRM	Zirconium (Zr)-Total	WG1556421-2	VA-HIGH-WATRM	0.0951	0.100	mg/L	95.1	80-120
Water	MB	Aluminum (Al)-Total	WG1556421-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Total	WG1556421-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Total	WG1556421-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Total	WG1556421-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Total	WG1556421-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Total	WG1556421-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Total	WG1556421-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Total	WG1556421-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Total	WG1556421-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Total	WG1556421-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Total	WG1556421-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Total	WG1556421-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Total	WG1556421-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Total	WG1556421-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Total	WG1556421-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Total	WG1556421-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Total	WG1556421-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Total	WG1556421-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Total	WG1556421-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Total	WG1556421-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Total	WG1556421-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Total	WG1556421-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Total	WG1556421-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Total	WG1556421-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Total	WG1556421-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Total	WG1556421-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Total	WG1556421-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Total	WG1556421-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Total	WG1556421-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Total	WG1556421-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Total	WG1556421-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Total	WG1556421-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Total	WG1556421-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MS	Aluminum (Al)-Total	WG1556421-4	L1215909-14	0.273	0.216	mg/L	128.7	70-130
Water	MS	Antimony (Sb)-Total	WG1556421-4	L1215909-14	0.0238	0.0200	mg/L	119.1	70-130
Water	MS	Barium (Ba)-Total	WG1556421-4	L1215909-14	0.0421	0.0365	mg/L	128.0	70-130
Water	MS	Beryllium (Be)-Total	WG1556421-4	L1215909-14	0.0516	0.0400	mg/L	128.9	70-130
Water	MS	Bismuth (Bi)-Total	WG1556421-4	L1215909-14	0.0117	0.0100	mg/L	117.4	70-130
Water	MS	Boron (B)-Total	WG1556421-4	L1215909-14	0.121	0.100	mg/L	121.0	70-130
Water	MS	Calcium (Ca)-Total	WG1556421-4	L1215909-14	119	117	mg/L	102.2	70-130
Water	MS	Chromium (Cr)-Total	WG1556421-4	L1215909-14	0.0506	0.0400	mg/L	126.6	70-130
Water	MS	Cobalt (Co)-Total	WG1556421-4	L1215909-14	0.0258	0.0200	mg/L	128.8	70-130
Water	MS	Copper (Cu)-Total	WG1556421-4	L1215909-14	0.0261	0.0203	mg/L	129.1	70-130
Water	MS	Iron (Fe)-Total	WG1556421-4	L1215909-14	2.55	2.01	mg/L	127.2	70-130
Water	MS	Lead (Pb)-Total	WG1556421-4	L1215909-14	0.0240	0.0200	mg/L	119.6	70-130
Water	MS	Magnesium (Mg)-Total	WG1556421-4	L1215909-14	108	104	mg/L	104.0	70-130

Water	MS	Manganese (Mn)-Total	WG1556421-4	L1215909-14	0.0280	0.0221	mg/L	129.1	70-130	
Water	MS	Molybdenum (Mo)-Total	WG1556421-4	L1215909-14	0.0256	0.0205	mg/L	125.6	70-130	
Water	MS	Nickel (Ni)-Total	WG1556421-4	L1215909-14	0.0509	0.0403	mg/L	126.3	70-130	
Water	MS	Potassium (K)-Total	WG1556421-4	L1215909-14	108	101	mg/L	107.2	70-130	
Water	MS	Selenium (Se)-Total	WG1556421-4	L1215909-14	0.0518	0.0402	mg/L	129.1	70-130	
Water	MS	Silver (Ag)-Total	WG1556421-4	L1215909-14	0.00477	0.00400	mg/L	119.3	70-130	
Water	MS	Sodium (Na)-Total	WG1556421-4	L1215909-14	3.49	3.12	mg/L	118.1	70-130	
Water	MS	Strontium (Sr)-Total	WG1556421-4	L1215909-14	0.121	0.116	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Total	WG1556421-4	L1215909-14	0.00477	0.00400	mg/L	119.3	70-130	
Water	MS	Tin (Sn)-Total	WG1556421-4	L1215909-14	0.0244	0.0200	mg/L	121.8	70-130	
Water	MS	Titanium (Ti)-Total	WG1556421-4	L1215909-14	0.0512	0.0400	mg/L	128.0	70-130	
Water	MS	Uranium (U)-Total	WG1556421-4	L1215909-14	0.00492	0.00436	mg/L	114.0	70-130	
Water	MS	Vanadium (V)-Total	WG1556421-4	L1215909-14	0.130	0.100	mg/L	129.8	70-130	
Water	MS	Zinc (Zn)-Total	WG1556421-4	L1215909-14	0.500	0.402	mg/L	124.5	70-130	
Water	MS	Zirconium (Zr)-Total	WG1556421-4	L1215909-14	0.0493	0.0400	mg/L	123.2	70-130	
Water	MS	Aluminum (Al)-Total	WG1556421-6	L1215909-31	0.248	0.216	mg/L	115.9	70-130	
Water	MS	Antimony (Sb)-Total	WG1556421-6	L1215909-31	0.0247	0.0201	mg/L	123.0	70-130	
Water	MS	Arsenic (As)-Total	WG1556421-6	L1215909-31	0.0255	0.0202	mg/L	126.7	70-130	
Water	MS	Barium (Ba)-Total	WG1556421-6	L1215909-31	0.0403	0.0360	mg/L	121.7	70-130	
Water	MS	Beryllium (Be)-Total	WG1556421-6	L1215909-31	0.0498	0.0400	mg/L	124.6	70-130	
Water	MS	Bismuth (Bi)-Total	WG1556421-6	L1215909-31	0.0115	0.0100	mg/L	115.4	70-130	
Water	MS	Boron (B)-Total	WG1556421-6	L1215909-31	0.118	0.100	mg/L	118.3	70-130	
Water	MS	Cadmium (Cd)-Total	WG1556421-6	L1215909-31	0.00474	0.00403	mg/L	117.9	70-130	
Water	MS	Calcium (Ca)-Total	WG1556421-6	L1215909-31	121	117	mg/L	104.2	70-130	
Water	MS	Chromium (Cr)-Total	WG1556421-6	L1215909-31	0.0450	0.0400	mg/L	112.5	70-130	
Water	MS	Cobalt (Co)-Total	WG1556421-6	L1215909-31	0.0229	0.0200	mg/L	114.2	70-130	
Water	MS	Copper (Cu)-Total	WG1556421-6	L1215909-31	0.0263	0.0204	mg/L	129.3	70-130	
Water	MS	Iron (Fe)-Total	WG1556421-6	L1215909-31	2.55	2.01	mg/L	126.9	70-130	
Water	MS	Lead (Pb)-Total	WG1556421-6	L1215909-31	0.0240	0.0201	mg/L	119.2	70-130	
Water	MS	Lithium (Li)-Total	WG1556421-6	L1215909-31	0.128	0.101	mg/L	126.8	70-130	
Water	MS	Magnesium (Mg)-Total	WG1556421-6	L1215909-31	107	104	mg/L	103.1	70-130	
Water	MS	Manganese (Mn)-Total	WG1556421-6	L1215909-31	0.0282	0.0222	mg/L	130.0	70-130	
Water	MS	Molybdenum (Mo)-Total	WG1556421-6	L1215909-31	0.0248	0.0205	mg/L	121.5	70-130	
Water	MS	Nickel (Ni)-Total	WG1556421-6	L1215909-31	0.0517	0.0404	mg/L	128.3	70-130	
Water	MS	Potassium (K)-Total	WG1556421-6	L1215909-31	107	101	mg/L	106.5	70-130	
Water	MS	Selenium (Se)-Total	WG1556421-6	L1215909-31	0.0494	0.0402	mg/L	123.1	70-130	
Water	MS	Silver (Ag)-Total	WG1556421-6	L1215909-31	0.00505	0.00400	mg/L	126.1	70-130	
Water	MS	Sodium (Na)-Total	WG1556421-6	L1215909-31	3.79	3.23	mg/L	127.6	70-130	
Water	MS	Strontium (Sr)-Total	WG1556421-6	L1215909-31	0.115	0.110	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Total	WG1556421-6	L1215909-31	0.00464	0.00401	mg/L	115.9	70-130	
Water	MS	Tin (Sn)-Total	WG1556421-6	L1215909-31	0.0242	0.0200	mg/L	121.1	70-130	
Water	MS	Titanium (Ti)-Total	WG1556421-6	L1215909-31	0.0502	0.0400	mg/L	125.6	70-130	
Water	MS	Uranium (U)-Total	WG1556421-6	L1215909-31	0.00503	0.00437	mg/L	116.5	70-130	
Water	MS	Vanadium (V)-Total	WG1556421-6	L1215909-31	0.116	0.100	mg/L	116.2	70-130	
Water	MS	Zinc (Zn)-Total	WG1556421-6	L1215909-31	0.466	0.401	mg/L	116.3	70-130	
Water	MS	Zirconium (Zr)-Total	WG1556421-6	L1215909-31	0.0461	0.0400	mg/L	115.2	70-130	
Water	MS	Aluminum (Al)-Total	WG1556421-10	Anonymous	0.203	0.206	mg/L	98.7	70-130	
Water	MS	Antimony (Sb)-Total	WG1556421-10	Anonymous	0.0203	0.0200	mg/L	101.3	70-130	
Water	MS	Arsenic (As)-Total	WG1556421-10	Anonymous	0.0249	0.0201	mg/L	123.7	70-130	
Water	MS	Barium (Ba)-Total	WG1556421-10	Anonymous	0.154	0.154	mg/L	N/A	-	MS-B
Water	MS	Beryllium (Be)-Total	WG1556421-10	Anonymous	0.0403	0.0400	mg/L	100.8	70-130	
Water	MS	Bismuth (Bi)-Total	WG1556421-10	Anonymous	0.00884	0.0100	mg/L	88.4	70-130	
Water	MS	Boron (B)-Total	WG1556421-10	Anonymous	0.100	0.100	mg/L	99.98	70-130	
Water	MS	Cadmium (Cd)-Total	WG1556421-10	Anonymous	0.00442	0.00402	mg/L	110.1	70-130	
Water	MS	Calcium (Ca)-Total	WG1556421-10	Anonymous	158	158	mg/L	100.5	70-130	
Water	MS	Chromium (Cr)-Total	WG1556421-10	Anonymous	0.0426	0.0400	mg/L	106.5	70-130	
Water	MS	Cobalt (Co)-Total	WG1556421-10	Anonymous	0.0214	0.0200	mg/L	107.0	70-130	
Water	MS	Copper (Cu)-Total	WG1556421-10	Anonymous	0.0212	0.0202	mg/L	104.9	70-130	
Water	MS	Iron (Fe)-Total	WG1556421-10	Anonymous	2.01	2.00	mg/L	100.3	70-130	
Water	MS	Lead (Pb)-Total	WG1556421-10	Anonymous	0.0192	0.0200	mg/L	95.8	70-130	
Water	MS	Lithium (Li)-Total	WG1556421-10	Anonymous	0.0997	0.105	mg/L	94.5	70-130	
Water	MS	Magnesium (Mg)-Total	WG1556421-10	Anonymous	116	115	mg/L	100.9	70-130	
Water	MS	Manganese (Mn)-Total	WG1556421-10	Anonymous	0.0221	0.0202	mg/L	109.5	70-130	
Water	MS	Molybdenum (Mo)-Total	WG1556421-10	Anonymous	0.0201	0.0205	mg/L	98.0	70-130	
Water	MS	Nickel (Ni)-Total	WG1556421-10	Anonymous	0.0424	0.0400	mg/L	106.1	70-130	
Water	MS	Potassium (K)-Total	WG1556421-10	Anonymous	105	101	mg/L	103.9	70-130	
Water	MS	Selenium (Se)-Total	WG1556421-10	Anonymous	0.0489	0.0404	mg/L	121.3	70-130	
Water	MS	Silver (Ag)-Total	WG1556421-10	Anonymous	0.00401	0.00400	mg/L	100.2	70-130	
Water	MS	Sodium (Na)-Total	WG1556421-10	Anonymous	3.83	3.72	mg/L	105.1	70-130	
Water	MS	Strontium (Sr)-Total	WG1556421-10	Anonymous	0.101	0.104	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Total	WG1556421-10	Anonymous	0.00391	0.00400	mg/L	97.7	70-130	
Water	MS	Tin (Sn)-Total	WG1556421-10	Anonymous	0.0197	0.0200	mg/L	98.7	70-130	
Water	MS	Titanium (Ti)-Total	WG1556421-10	Anonymous	0.0415	0.0400	mg/L	103.7	70-130	
Water	MS	Uranium (U)-Total	WG1556421-10	Anonymous	0.00426	0.00427	mg/L	99.9	70-130	
Water	MS	Vanadium (V)-Total	WG1556421-10	Anonymous	0.111	0.100	mg/L	110.9	70-130	
Water	MS	Zinc (Zn)-Total	WG1556421-10	Anonymous	0.432	0.400	mg/L	107.9	70-130	
Water	MS	Zirconium (Zr)-Total	WG1556421-10	Anonymous	0.0400	0.0400	mg/L	100.1	70-130	

Dissolved Metals

Water	CRM	Aluminum (Al)-Dissolved	WG1556418-2	VA-HIGH-WATRM	2.07	2.00	mg/L	103.6	80-120
Water	CRM	Antimony (Sb)-Dissolved	WG1556418-2	VA-HIGH-WATRM	1.03	1.00	mg/L	102.7	80-120
Water	CRM	Arsenic (As)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.992	1.00	mg/L	99.2	80-120
Water	CRM	Barium (Ba)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.1	80-120
Water	CRM	Beryllium (Be)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.106	0.100	mg/L	106.5	80-120
Water	CRM	Bismuth (Bi)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.944	1.00	mg/L	94.4	80-120
Water	CRM	Boron (B)-Dissolved	WG1556418-2	VA-HIGH-WATRM	1.05	1.00	mg/L	104.6	80-120
Water	CRM	Cadmium (Cd)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.0989	0.100	mg/L	98.9	80-120
Water	CRM	Calcium (Ca)-Dissolved	WG1556418-2	VA-HIGH-WATRM	51.0	50.0	mg/L	102.0	80-120
Water	CRM	Chromium (Cr)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.242	0.250	mg/L	96.8	80-120
Water	CRM	Cobalt (Co)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.4	80-120
Water	CRM	Copper (Cu)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.6	80-120
Water	CRM	Iron (Fe)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.985	1.00	mg/L	98.5	80-120
Water	CRM	Lead (Pb)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.488	0.500	mg/L	97.6	80-120
Water	CRM	Lithium (Li)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.278	0.250	mg/L	111.4	80-120
Water	CRM	Magnesium (Mg)-Dissolved	WG1556418-2	VA-HIGH-WATRM	51.0	50.0	mg/L	102.1	80-120
Water	CRM	Manganese (Mn)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.249	0.250	mg/L	99.7	80-120
Water	CRM	Molybdenum (Mo)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.246	0.250	mg/L	98.3	80-120
Water	CRM	Nickel (Ni)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.488	0.500	mg/L	97.5	80-120
Water	CRM	Phosphorus (P)-Dissolved	WG1556418-2	VA-HIGH-WATRM	2.50	2.50	mg/L	100.0	80-120
Water	CRM	Potassium (K)-Dissolved	WG1556418-2	VA-HIGH-WATRM	50.5	50.0	mg/L	101.0	80-120
Water	CRM	Selenium (Se)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.973	1.00	mg/L	97.3	80-120
Water	CRM	Silicon (Si)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.981	1.00	mg/L	98.1	80-120
Water	CRM	Silver (Ag)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.102	0.100	mg/L	101.6	80-120
Water	CRM	Sodium (Na)-Dissolved	WG1556418-2	VA-HIGH-WATRM	52.3	50.0	mg/L	104.7	80-120
Water	CRM	Strontium (Sr)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.249	0.250	mg/L	99.7	80-120
Water	CRM	Thallium (Tl)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.974	1.00	mg/L	97.4	80-120
Water	CRM	Tin (Sn)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.496	0.500	mg/L	99.1	80-120
Water	CRM	Titanium (Ti)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.0	80-120
Water	CRM	Uranium (U)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.00481	0.00500	mg/L	96.3	80-120
Water	CRM	Vanadium (V)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.503	0.500	mg/L	100.6	80-120
Water	CRM	Zinc (Zn)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.486	0.500	mg/L	97.1	80-120
Water	CRM	Zirconium (Zr)-Dissolved	WG1556418-2	VA-HIGH-WATRM	0.0971	0.100	mg/L	97.1	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1558346-2	VA-HG-L-WATRM	0.00499	0.00500	ug/L	99.8	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1559700-2	VA-HG-L-WATRM	0.00500	0.00500	ug/L	100.0	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1561409-2	VA-HG-L-WATRM	0.00502	0.00500	ug/L	100.4	80-120
Water	MB	Aluminum (Al)-Dissolved	WG1556418-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Dissolved	WG1556418-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Dissolved	WG1556418-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Dissolved	WG1556418-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Dissolved	WG1556418-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Dissolved	WG1556418-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Dissolved	WG1556418-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Dissolved	WG1556418-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Dissolved	WG1556418-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Dissolved	WG1556418-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Dissolved	WG1556418-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Dissolved	WG1556418-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Dissolved	WG1556418-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Dissolved	WG1556418-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Dissolved	WG1556418-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Dissolved	WG1556418-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Dissolved	WG1556418-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Dissolved	WG1556418-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Dissolved	WG1556418-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Dissolved	WG1556418-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Dissolved	WG1556418-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Dissolved	WG1556418-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Dissolved	WG1556418-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Dissolved	WG1556418-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Dissolved	WG1556418-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Dissolved	WG1556418-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Dissolved	WG1556418-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Dissolved	WG1556418-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Dissolved	WG1556418-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Dissolved	WG1556418-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Dissolved	WG1556418-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Dissolved	WG1556418-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Dissolved	WG1556418-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Mercury (Hg)-Dissolved	WG1558346-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1559700-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1561409-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MS	Aluminum (Al)-Dissolved	WG1556418-7	L1215909-2	0.241	0.210	mg/L	115.7	70-130
Water	MS	Antimony (Sb)-Dissolved	WG1556418-7	L1215909-2	0.0222	0.0200	mg/L	110.7	70-130
Water	MS	Arsenic (As)-Dissolved	WG1556418-7	L1215909-2	0.0255	0.0202	mg/L	126.4	70-130
Water	MS	Barium (Ba)-Dissolved	WG1556418-7	L1215909-2	0.0389	0.0358	mg/L	115.2	70-130

Water	MS	Beryllium (Be)-Dissolved	WG1556418-7	L1215909-2	0.0445	0.0400	mg/L	111.3	70-130	
Water	MS	Bismuth (Bi)-Dissolved	WG1556418-7	L1215909-2	0.00990	0.0100	mg/L	99.0	70-130	
Water	MS	Boron (B)-Dissolved	WG1556418-7	L1215909-2	0.104	0.100	mg/L	104.2	70-130	
Water	MS	Cadmium (Cd)-Dissolved	WG1556418-7	L1215909-2	0.00464	0.00401	mg/L	115.7	70-130	
Water	MS	Calcium (Ca)-Dissolved	WG1556418-7	L1215909-2	121	117	mg/L	103.8	70-130	
Water	MS	Chromium (Cr)-Dissolved	WG1556418-7	L1215909-2	0.0452	0.0400	mg/L	112.9	70-130	
Water	MS	Cobalt (Co)-Dissolved	WG1556418-7	L1215909-2	0.0227	0.0200	mg/L	113.3	70-130	
Water	MS	Copper (Cu)-Dissolved	WG1556418-7	L1215909-2	0.0229	0.0203	mg/L	113.2	70-130	
Water	MS	Iron (Fe)-Dissolved	WG1556418-7	L1215909-2	2.20	2.00	mg/L	109.9	70-130	
Water	MS	Lead (Pb)-Dissolved	WG1556418-7	L1215909-2	0.0216	0.0200	mg/L	107.7	70-130	
Water	MS	Lithium (Li)-Dissolved	WG1556418-7	L1215909-2	0.106	0.101	mg/L	105.2	70-130	
Water	MS	Magnesium (Mg)-Dissolved	WG1556418-7	L1215909-2	107	104	mg/L	102.8	70-130	
Water	MS	Manganese (Mn)-Dissolved	WG1556418-7	L1215909-2	0.0238	0.0207	mg/L	115.6	70-130	
Water	MS	Molybdenum (Mo)-Dissolved	WG1556418-7	L1215909-2	0.0213	0.0205	mg/L	104.0	70-130	
Water	MS	Nickel (Ni)-Dissolved	WG1556418-7	L1215909-2	0.0449	0.0404	mg/L	111.3	70-130	
Water	MS	Potassium (K)-Dissolved	WG1556418-7	L1215909-2	107	101	mg/L	106.6	70-130	
Water	MS	Selenium (Se)-Dissolved	WG1556418-7	L1215909-2	0.0493	0.0402	mg/L	122.8	70-130	
Water	MS	Silver (Ag)-Dissolved	WG1556418-7	L1215909-2	0.00431	0.00400	mg/L	107.7	70-130	
Water	MS	Sodium (Na)-Dissolved	WG1556418-7	L1215909-2	3.38	3.09	mg/L	114.2	70-130	
Water	MS	Strontium (Sr)-Dissolved	WG1556418-7	L1215909-2	0.108	0.107	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Dissolved	WG1556418-7	L1215909-2	0.00435	0.00400	mg/L	108.7	70-130	
Water	MS	Tin (Sn)-Dissolved	WG1556418-7	L1215909-2	0.0216	0.0200	mg/L	107.8	70-130	
Water	MS	Titanium (Ti)-Dissolved	WG1556418-7	L1215909-2	0.0480	0.0400	mg/L	120.0	70-130	
Water	MS	Uranium (U)-Dissolved	WG1556418-7	L1215909-2	0.00474	0.00437	mg/L	109.2	70-130	
Water	MS	Vanadium (V)-Dissolved	WG1556418-7	L1215909-2	0.116	0.100	mg/L	116.3	70-130	
Water	MS	Zinc (Zn)-Dissolved	WG1556418-7	L1215909-2	0.457	0.403	mg/L	113.5	70-130	
Water	MS	Zirconium (Zr)-Dissolved	WG1556418-7	L1215909-2	0.0424	0.0400	mg/L	106.1	70-130	
Water	MS	Aluminum (Al)-Dissolved	WG1556418-9	L1215909-31	0.259	0.211	mg/L	124.0	70-130	
Water	MS	Antimony (Sb)-Dissolved	WG1556418-9	L1215909-31	0.0230	0.0201	mg/L	114.3	70-130	
Water	MS	Barium (Ba)-Dissolved	WG1556418-9	L1215909-31	0.0412	0.0357	mg/L	127.4	70-130	
Water	MS	Beryllium (Be)-Dissolved	WG1556418-9	L1215909-31	0.0478	0.0400	mg/L	119.4	70-130	
Water	MS	Bismuth (Bi)-Dissolved	WG1556418-9	L1215909-31	0.0112	0.0100	mg/L	112.1	70-130	
Water	MS	Boron (B)-Dissolved	WG1556418-9	L1215909-31	0.109	0.100	mg/L	109.2	70-130	
Water	MS	Cadmium (Cd)-Dissolved	WG1556418-9	L1215909-31	0.00511	0.00402	mg/L	127.2	70-130	
Water	MS	Calcium (Ca)-Dissolved	WG1556418-9	L1215909-31	122	117	mg/L	104.0	70-130	
Water	MS	Chromium (Cr)-Dissolved	WG1556418-9	L1215909-31	0.0500	0.0400	mg/L	124.9	70-130	
Water	MS	Cobalt (Co)-Dissolved	WG1556418-9	L1215909-31	0.0249	0.0200	mg/L	124.3	70-130	
Water	MS	Copper (Cu)-Dissolved	WG1556418-9	L1215909-31	0.0250	0.0203	mg/L	124.0	70-130	
Water	MS	Iron (Fe)-Dissolved	WG1556418-9	L1215909-31	2.44	2.00	mg/L	121.7	70-130	
Water	MS	Lead (Pb)-Dissolved	WG1556418-9	L1215909-31	0.0230	0.0201	mg/L	114.7	70-130	
Water	MS	Lithium (Li)-Dissolved	WG1556418-9	L1215909-31	0.122	0.101	mg/L	121.5	70-130	
Water	MS	Magnesium (Mg)-Dissolved	WG1556418-9	L1215909-31	106	104	mg/L	101.9	70-130	
Water	MS	Manganese (Mn)-Dissolved	WG1556418-9	L1215909-31	0.0260	0.0208	mg/L	126.1	70-130	
Water	MS	Molybdenum (Mo)-Dissolved	WG1556418-9	L1215909-31	0.0236	0.0205	mg/L	115.6	70-130	
Water	MS	Nickel (Ni)-Dissolved	WG1556418-9	L1215909-31	0.0496	0.0403	mg/L	123.3	70-130	
Water	MS	Potassium (K)-Dissolved	WG1556418-9	L1215909-31	104	101	mg/L	103.7	70-130	
Water	MS	Selenium (Se)-Dissolved	WG1556418-9	L1215909-31	0.0492	0.0402	mg/L	122.5	70-130	
Water	MS	Silver (Ag)-Dissolved	WG1556418-9	L1215909-31	0.00476	0.00400	mg/L	118.9	70-130	
Water	MS	Sodium (Na)-Dissolved	WG1556418-9	L1215909-31	3.63	3.26	mg/L	118.6	70-130	
Water	MS	Strontium (Sr)-Dissolved	WG1556418-9	L1215909-31	0.113	0.112	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Dissolved	WG1556418-9	L1215909-31	0.00459	0.00401	mg/L	114.6	70-130	
Water	MS	Tin (Sn)-Dissolved	WG1556418-9	L1215909-31	0.0235	0.0200	mg/L	117.5	70-130	
Water	MS	Titanium (Ti)-Dissolved	WG1556418-9	L1215909-31	0.0500	0.0400	mg/L	125.0	70-130	
Water	MS	Uranium (U)-Dissolved	WG1556418-9	L1215909-31	0.00492	0.00437	mg/L	113.6	70-130	
Water	MS	Vanadium (V)-Dissolved	WG1556418-9	L1215909-31	0.128	0.100	mg/L	127.9	70-130	
Water	MS	Zinc (Zn)-Dissolved	WG1556418-9	L1215909-31	0.499	0.402	mg/L	124.3	70-130	
Water	MS	Zirconium (Zr)-Dissolved	WG1556418-9	L1215909-31	0.0451	0.0400	mg/L	112.8	70-130	

Project
Report To Mark Tinholt, TECK METALS LTD.
ALS File No. L1271152
Date Received 21-Feb-13 11:10
Date 05-Mar-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1271152-6	Water	WG1630807-32	Conductivity	138	138	uS/cm	0.1	10	-	-	-
L1271152-24	Water	WG1630807-33	Conductivity	145	144	uS/cm	0.3	10	-	-	-
L1271152-6	Water	WG1630807-32	pH	8.06	8.06	pH	-	-	0.00	0.3	J
L1271152-8	Water	WG1631998-2	pH	5.58	5.59	pH	-	-	0.01	0.3	J
L1271152-24	Water	WG1630807-33	pH	8.06	8.06	pH	-	-	0.00	0.3	J
L1271152-11	Water	WG1631983-6	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1271152-26	Water	WG1632014-6	Total Dissolved Solids	97	93	mg/L	4.7	20	-	-	-
L1271152-9	Water	WG1630927-12	Turbidity	0.52	0.53	NTU	1.1	15	-	-	-
L1271152-24	Water	WG1630927-15	Turbidity	0.50	0.50	NTU	0.4	15	-	-	-
Anions and Nutrients											
L1271152-2	Water	WG1632441-9	Alkalinity, Total (as CaCO3)	56.1	65.7	mg/L	16	20	-	-	-
L1271152-20	Water	WG1632441-10	Alkalinity, Total (as CaCO3)	71.6	66.3	mg/L	7.7	20	-	-	-
L1271152-1	Water	WG1631890-11	Ammonia, Total (as N)	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1271152-27	Water	WG1631665-9	Bromide (Br)	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1271152-27	Water	WG1631665-9	Chloride (Cl)	0.80	0.80	mg/L	0.9	20	-	-	-
L1271152-27	Water	WG1631665-9	Fluoride (F)	0.065	0.066	mg/L	1.2	20	-	-	-
L1271152-27	Water	WG1631665-9	Nitrate (as N)	0.150	0.150	mg/L	0.2	20	-	-	-
L1271152-27	Water	WG1631665-9	Nitrite (as N)	<0.0010	<0.0010	mg/L	N/A	20	-	-	RPD-NA
L1271152-1	Water	WG1631138-6	Total Kjeldahl Nitrogen	0.062	0.066	mg/L	5.8	20	-	-	-
L1271152-28	Water	WG1631984-6	Total Kjeldahl Nitrogen	0.056	0.060	mg/L	6.8	20	-	-	-
L1271152-12	Water	WG1630858-11	Phosphorus (P)-Total Dissolved	0.0028	0.0027	mg/L	4.7	20	-	-	-
L1271152-26	Water	WG1630858-15	Phosphorus (P)-Total Dissolved	0.0027	0.0027	mg/L	3.0	20	-	-	-
L1271152-12	Water	WG1630858-11	Phosphorus (P)-Total	0.0039	0.0039	mg/L	0.3	20	-	-	-
L1271152-26	Water	WG1630858-15	Phosphorus (P)-Total	0.0036	0.0031	mg/L	16	20	-	-	-
L1271152-27	Water	WG1631665-9	Sulfate (SO4)	11.7	11.7	mg/L	0.2	20	-	-	-
Organic / Inorganic Carbon											
L1271152-16	Water	WG1632977-6	Total Organic Carbon	1.23	1.24	mg/L	1.4	20	-	-	-
L1271152-29	Water	WG1633876-2	Total Organic Carbon	1.02	1.01	mg/L	0.5	20	-	-	-
Total Metals											
L1271152-18	Water	WG1635525-12	Mercury (Hg)-Total	<0.0050	<0.0050	ug/L	N/A	20	-	-	RPD-NA
Dissolved Metals											
L1271152-3	Water	WG1635325-3	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1271152-10	Water	WG1635325-5	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1271152-22	Water	WG1635525-14	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
Aggregate Organics											
L1271152-7	Water	WG1630849-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
Anions and Nutrients											
L1271152-32	Water	WG1631890-13	Ammonia, Total (as N)	0.0123	0.0117	mg/L	5.4	20	-	-	-

Project
Report To Mark Tinholt, TECK METALS LTD.
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QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	pH	WG1631998-1	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	Conductivity	WG1630807-17	VA-EC-PCT-CONTROL	143	147	uS/cm	97.2	90-110	
Water	CRM	Conductivity	WG1630807-18	VA-EC-PCT-CONTROL	142	147	uS/cm	96.6	90-110	
Water	CRM	Conductivity	WG1630807-19	VA-EC-PCT-CONTROL	141	147	uS/cm	96.3	90-110	
Water	CRM	Conductivity	WG1630807-20	VA-EC-PCT-CONTROL	143	147	uS/cm	97.1	90-110	
Water	CRM	Conductivity	WG1630807-21	VA-EC-PCT-CONTROL	142	147	uS/cm	96.9	90-110	
Water	CRM	Conductivity	WG1630807-22	VA-EC-PCT-CONTROL	142	147	uS/cm	96.7	90-110	
Water	CRM	Conductivity	WG1630807-23	VA-EC-PCT-CONTROL	145	147	uS/cm	98.4	90-110	
Water	CRM	pH	WG1630807-24	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1630807-25	VA-PH7-BUF	6.99	7.00	pH	6.99	6.9-7.1	
Water	CRM	pH	WG1630807-26	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1630807-27	VA-PH7-BUF	6.99	7.00	pH	6.99	6.9-7.1	
Water	CRM	pH	WG1630807-28	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1630807-29	VA-PH7-BUF	7.00	7.00	pH	7.00	6.9-7.1	
Water	CRM	pH	WG1630807-30	VA-PH7-BUF	7.00	7.00	pH	7.00	6.9-7.1	
Water	LCS	Total Dissolved Solids	WG1631027-2		426	425	mg/L	100.3	85-115	
Water	LCS	Total Dissolved Solids	WG1631027-5		414	425	mg/L	97.4	85-115	
Water	LCS	Total Dissolved Solids	WG1631027-8		431	425	mg/L	101.3	85-115	
Water	LCS	Total Suspended Solids	WG1631983-2		77.0	75.0	mg/L	102.7	85-115	
Water	LCS	Total Suspended Solids	WG1631983-5		74.0	75.0	mg/L	98.7	85-115	
Water	LCS	Total Suspended Solids	WG1631983-8		69.5	75.0	mg/L	92.7	85-115	
Water	LCS	Total Dissolved Solids	WG1632014-2		428	425	mg/L	100.6	85-115	
Water	LCS	Total Dissolved Solids	WG1632014-5		445	425	mg/L	104.8	85-115	
Water	LCS	Total Dissolved Solids	WG1632014-8		450	425	mg/L	105.8	85-115	
Water	LCS	Total Suspended Solids	WG1631983-11		64.9	75.0	mg/L	86.5	85-115	
Water	LCS	Total Dissolved Solids	WG1632014-11		432	425	mg/L	101.7	85-115	
Water	LCS	Total Dissolved Solids	WG1632014-14		424	425	mg/L	99.8	85-115	
Water	MB	Conductivity	WG1630807-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1630807-7		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1630927-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1630927-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1630927-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1631027-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1631027-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1631027-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1631983-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1631983-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1631983-7		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1632014-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1632014-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1632014-7		<10	<10	mg/L	-	10	
Water	MB	Turbidity	WG1630927-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1630927-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Suspended Solids	WG1631983-10		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1632014-10		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1632014-13		<10	<10	mg/L	-	10	
Anions and Nutrients										
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-2	VA-ERA-PO4	4.18	3.99	mg/L	104.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-2	VA-ERA-PO4	4.19	3.99	mg/L	105.1	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-6	VA-ERA-PO4	4.22	3.99	mg/L	105.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-6	VA-ERA-PO4	4.19	3.99	mg/L	105.0	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-2	VA-ERA-PO4	4.19	3.99	mg/L	104.9	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-6	VA-ERA-PO4	4.40	3.99	mg/L	110.3	80-120	
Water	CRM	Ammonia, Total (as N)	WG1631890-2	VA-NH3-F	0.118	0.120	mg/L	98.7	85-115	
Water	CRM	Ammonia, Total (as N)	WG1631890-4	VA-NH3-F	0.115	0.120	mg/L	96.2	85-115	
Water	CRM	Ammonia, Total (as N)	WG1631890-6	VA-NH3-F	0.113	0.120	mg/L	94.0	85-115	
Water	CRM	Ammonia, Total (as N)	WG1631890-8	VA-NH3-F	0.116	0.120	mg/L	96.3	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1632441-2	VA-ALKL-CONTROL	15.8	15.0	mg/L	105.0	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1632441-5	VA-ALKM-CONTROL	78.0	75.0	mg/L	104.0	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1632441-8	VA-ALKH-CONTROL	251	250	mg/L	100.5	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-10	VA-ERA-PO4	4.19	3.99	mg/L	105.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-10	VA-ERA-PO4	4.04	3.99	mg/L	101.2	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-14	VA-ERA-PO4	4.28	3.99	mg/L	107.4	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-14	VA-ERA-PO4	4.14	3.99	mg/L	103.7	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-18	VA-ERA-PO4	4.14	3.99	mg/L	103.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-18	VA-ERA-PO4	4.23	3.99	mg/L	106.1	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-22	VA-ERA-PO4	4.29	3.99	mg/L	107.5	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-22	VA-ERA-PO4	4.03	3.99	mg/L	101.1	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1630858-26	VA-ERA-PO4	4.36	3.99	mg/L	109.3	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630858-26	VA-ERA-PO4	4.18	3.99	mg/L	104.9	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-10	VA-ERA-PO4	4.48	3.99	mg/L	112.3	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-14	VA-ERA-PO4	4.60	3.99	mg/L	115.4	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-18	VA-ERA-PO4	4.53	3.99	mg/L	113.6	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-22	VA-ERA-PO4	4.60	3.99	mg/L	115.4	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1631669-26	VA-ERA-PO4	4.60	3.99	mg/L	115.4	80-120	
Water	CRM	Ammonia, Total (as N)	WG1631890-10	VA-NH3-F	0.115	0.120	mg/L	96.1	85-115	
Water	LCS	Total Kjeldahl Nitrogen	WG1631138-2		1.03	1.00	mg/L	102.5	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1631138-5		1.09	1.00	mg/L	108.6	75-125	
Water	LCS	Bromide (Br)	WG1631513-2		0.510	0.500	mg/L	102.1	85-115	
Water	LCS	Chloride (Cl)	WG1631513-2		101	100	mg/L	101.3	85-115	
Water	LCS	Fluoride (F)	WG1631513-2		1.08	1.00	mg/L	108.4	85-115	
Water	LCS	Nitrate (as N)	WG1631513-2		2.54	2.50	mg/L	101.7	85-115	
Water	LCS	Nitrite (as N)	WG1631513-2		0.511	0.500	mg/L	102.1	85-115	
Water	LCS	Sulfate (SO4)	WG1631513-2		101	100	mg/L	101.5	85-115	
Water	LCS	Bromide (Br)	WG1631513-6		0.516	0.500	mg/L	103.1	85-115	

Water	LCS	Chloride (Cl)	WG1631513-6		101	100	mg/L	101.2	85-115	
Water	LCS	Fluoride (F)	WG1631513-6		1.08	1.00	mg/L	108.2	85-115	
Water	LCS	Nitrate (as N)	WG1631513-6		2.55	2.50	mg/L	102.0	85-115	
Water	LCS	Nitrite (as N)	WG1631513-6		0.523	0.500	mg/L	104.7	85-115	
Water	LCS	Sulfate (SO4)	WG1631513-6		101	100	mg/L	101.5	85-115	
Water	LCS	Bromide (Br)	WG1631665-2		0.514	0.500	mg/L	102.9	85-115	
Water	LCS	Chloride (Cl)	WG1631665-2		101	100	mg/L	100.9	85-115	
Water	LCS	Fluoride (F)	WG1631665-2		1.07	1.00	mg/L	106.7	85-115	
Water	LCS	Nitrate (as N)	WG1631665-2		2.54	2.50	mg/L	101.6	85-115	
Water	LCS	Nitrite (as N)	WG1631665-2		0.516	0.500	mg/L	103.2	85-115	
Water	LCS	Sulfate (SO4)	WG1631665-2		101	100	mg/L	101.2	85-115	
Water	LCS	Total Kjeldahl Nitrogen	WG1631984-2		0.919	1.00	mg/L	91.9	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1631984-5		0.877	1.00	mg/L	87.7	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1632041-2		1.01	1.00	mg/L	100.6	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1632041-5		0.958	1.00	mg/L	95.8	75-125	
Water	LCS	Bromide (Br)	WG1631665-15		0.505	0.500	mg/L	101.1	85-115	
Water	LCS	Chloride (Cl)	WG1631665-15		101	100	mg/L	101.4	85-115	
Water	LCS	Fluoride (F)	WG1631665-15		1.07	1.00	mg/L	106.7	85-115	
Water	LCS	Nitrate (as N)	WG1631665-15		2.55	2.50	mg/L	102.0	85-115	
Water	LCS	Nitrite (as N)	WG1631665-15		0.527	0.500	mg/L	105.4	85-115	
Water	LCS	Sulfate (SO4)	WG1631665-15		102	100	mg/L	102.0	85-115	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Total Kjeldahl Nitrogen	WG1631138-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1631138-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Bromide (Br)	WG1631513-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631513-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631513-1		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631513-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631513-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631513-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1631513-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631513-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631513-4		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631513-4		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631513-4		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631513-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1631665-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631665-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631665-1		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631665-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631665-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631665-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1631665-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631665-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631665-4		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631665-4		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631665-4		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631665-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1631665-7		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631665-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631665-7		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631665-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631665-7		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631665-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Ammonia, Total (as N)	WG1631890-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1631890-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1631890-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1631890-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1631890-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Total Kjeldahl Nitrogen	WG1631984-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1631984-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1632041-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1632041-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Alkalinity, Total (as CaCO3)	WG1632441-1		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1632441-4		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1632441-7		<2.0	<2	mg/L	-	2	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1630858-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1630858-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Bromide (Br)	WG1631665-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631665-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631665-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631665-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631665-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631665-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1631665-13		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1631665-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1631665-13		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1631665-13		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1631665-13		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1631665-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1631669-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MS	Phosphorus (P)-Total Dissolved	WG1630858-4	Anonymous	0.0471	0.0500	mg/L	94.3	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-4	Anonymous	0.0520	0.0534	mg/L	97.3	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-8	Anonymous	0.120	0.112	mg/L	N/A	-	MS-B
Water	MS	Chloride (Cl)	WG1631513-5	Anonymous	102	100	mg/L	101.9	75-125	
Water	MS	Sulfate (SO4)	WG1631513-5	Anonymous	162	171	mg/L	90.5	75-125	

Water	MS	Bromide (Br)	WG1631665-5	Anonymous	0.488	0.500	mg/L	97.6	75-125	
Water	MS	Chloride (Cl)	WG1631665-5	Anonymous	101	101	mg/L	100.2	75-125	
Water	MS	Fluoride (F)	WG1631665-5	Anonymous	1.11	1.05	mg/L	105.3	75-125	
Water	MS	Nitrate (as N)	WG1631665-5	Anonymous	2.60	2.58	mg/L	100.8	75-125	
Water	MS	Nitrite (as N)	WG1631665-5	Anonymous	0.496	0.500	mg/L	99.2	75-125	
Water	MS	Sulfate (SO4)	WG1631665-5	Anonymous	122	126	mg/L	96.7	75-125	
Water	MS	Phosphorus (P)-Total Dissolved	WG1631669-4	Anonymous	0.0512	0.0500	mg/L	102.4	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1630858-12	L1271152-13	0.0517	0.0525	mg/L	98.5	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-12	L1271152-13	0.0529	0.0540	mg/L	97.8	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1630858-16	L1271152-27	0.0519	0.0529	mg/L	98.0	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-16	L1271152-27	0.0539	0.0542	mg/L	99.4	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-20	Anonymous	0.0529	0.0536	mg/L	98.5	70-130	
Water	MS	Phosphorus (P)-Total	WG1630858-24	Anonymous	0.150	0.142	mg/L	N/A	-	MS-B
Water	MS	Bromide (Br)	WG1631665-11	L1271152-27	0.494	0.500	mg/L	98.9	75-125	
Water	MS	Chloride (Cl)	WG1631665-11	L1271152-27	101	101	mg/L	100.5	75-125	
Water	MS	Fluoride (F)	WG1631665-11	L1271152-27	1.13	1.06	mg/L	106.2	75-125	
Water	MS	Nitrate (as N)	WG1631665-11	L1271152-27	2.66	2.65	mg/L	100.5	75-125	
Water	MS	Nitrite (as N)	WG1631665-11	L1271152-27	0.508	0.500	mg/L	101.6	75-125	
Water	MS	Sulfate (SO4)	WG1631665-11	L1271152-27	111	112	mg/L	99.1	75-125	
Water	MS	Chloride (Cl)	WG1631665-14	Anonymous	101	100	mg/L	101.0	75-125	
Water	MS	Sulfate (SO4)	WG1631665-14	Anonymous	115	117	mg/L	98.1	75-125	
Water	MS	Phosphorus (P)-Total Dissolved	WG1631669-12	Anonymous	0.0596	0.0559	mg/L	107.4	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1631669-16	Anonymous	0.0575	0.0525	mg/L	109.9	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1631669-20	Anonymous	0.0537	0.0500	mg/L	107.4	70-130	
Water	MS	Ammonia, Total (as N)	WG1631890-12	L1271152-1	0.191	0.200	mg/L	95.7	75-125	
Water	MS	Ammonia, Total (as N)	WG1631890-14	L1271152-32	0.199	0.212	mg/L	93.6	75-125	

Organic / Inorganic Carbon

Water	LCS	Total Organic Carbon	WG1632977-1		8.84	8.57	mg/L	103.2	80-120	
Water	LCS	Total Organic Carbon	WG1632977-5		8.81	8.57	mg/L	102.8	80-120	
Water	LCS	Total Organic Carbon	WG1632977-9		8.66	8.57	mg/L	101.0	80-120	
Water	LCS	Total Organic Carbon	WG1633876-1		9.34	8.57	mg/L	109.0	80-120	
Water	LCS	Total Organic Carbon	WG1633876-5		9.19	8.57	mg/L	107.2	80-120	
Water	LCS	Total Organic Carbon	WG1635395-1		9.05	8.57	mg/L	105.6	80-120	
Water	LCS	Total Organic Carbon	WG1635395-4		9.05	8.57	mg/L	105.6	80-120	
Water	LCS	Total Organic Carbon	WG1632977-17		7.34	8.57	mg/L	85.6	80-120	
Water	LCS	Total Organic Carbon	WG1632977-21		9.19	8.57	mg/L	107.2	80-120	
Water	MB	Total Organic Carbon	WG1632977-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1632977-8		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1633876-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1635395-3		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1632977-16		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1632977-20		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Total Organic Carbon	WG1632977-3	L1271152-7	5.64	5.00	mg/L	112.8	70-130	
Water	MS	Total Organic Carbon	WG1632977-7	L1271152-25	6.37	6.16	mg/L	104.3	70-130	
Water	MS	Total Organic Carbon	WG1633876-3	L1271152-35	6.09	5.83	mg/L	105.2	70-130	
Water	MS	Total Organic Carbon	WG1632977-15	Anonymous	14.6	14.7	mg/L	N/A	-	MS-B

Total Metals

Water	LCS	Mercury (Hg)-Total	WG1635325-2		0.00495	0.00500	ug/L	98.9	80-120	
Water	LCS	Mercury (Hg)-Total	WG1635525-10		0.00517	0.00500	ug/L	103.3	80-120	
Water	MB	Mercury (Hg)-Total	WG1635325-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1635525-9		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Total	WG1635525-13	L1271152-21	0.00533	0.00500	ug/L	106.5	70-130	
Water	MS	Mercury (Hg)-Total	WG1635525-15	Anonymous	0.00611	0.0050	ug/L	122.1	70-130	

Total Metals (Undigested)

Water	CRM	Calcium (Ca)-Total	WG1630674-2	VA-HIGH-WATRM	53.3	50.0	mg/L	106.5	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1630674-2	VA-HIGH-WATRM	51.1	50.0	mg/L	102.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1630674-2	VA-HIGH-WATRM	2.50	2.50	mg/L	100.0	80-120	
Water	CRM	Potassium (K)-Total	WG1630674-2	VA-HIGH-WATRM	51.2	50.0	mg/L	102.3	80-120	
Water	CRM	Silicon (Si)-Total	WG1630674-2	VA-HIGH-WATRM	1.04	1.00	mg/L	103.8	80-120	
Water	MB	Aluminum (Al)-Total	WG1630674-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Total	WG1630674-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Total	WG1630674-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Total	WG1630674-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Total	WG1630674-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Total	WG1630674-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Total	WG1630674-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Total	WG1630674-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Total	WG1630674-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Total	WG1630674-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Total	WG1630674-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Total	WG1630674-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Total	WG1630674-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Total	WG1630674-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Total	WG1630674-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Total	WG1630674-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Total	WG1630674-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Total	WG1630674-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Total	WG1630674-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Total	WG1630674-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Total	WG1630674-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Total	WG1630674-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Total	WG1630674-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Total	WG1630674-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Total	WG1630674-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Total	WG1630674-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Total	WG1630674-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Total	WG1630674-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Total	WG1630674-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Total	WG1630674-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Total	WG1630674-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Total	WG1630674-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Total	WG1630674-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MS	Aluminum (Al)-Total	WG1630674-8	Anonymous	0.200	0.206	mg/L	97.1	70-130	
Water	MS	Antimony (Sb)-Total	WG1630674-8	Anonymous	0.0212	0.0201	mg/L	105.4	70-130	
Water	MS	Arsenic (As)-Total	WG1630674-8	Anonymous	0.0214	0.0200	mg/L	107.1	70-130	
Water	MS	Barium (Ba)-Total	WG1630674-8	Anonymous	0.131	0.133	mg/L	N/A	-	MS-B

Water	MS	Beryllium (Be)-Total	WG1630674-8	Anonymous	0.0405	0.0400	mg/L	101.2	70-130	
Water	MS	Bismuth (Bi)-Total	WG1630674-8	Anonymous	0.00897	0.0100	mg/L	89.7	70-130	
Water	MS	Boron (B)-Total	WG1630674-8	Anonymous	0.0959	0.100	mg/L	95.9	70-130	
Water	MS	Cadmium (Cd)-Total	WG1630674-8	Anonymous	0.00400	0.00403	mg/L	99.3	70-130	
Water	MS	Calcium (Ca)-Total	WG1630674-8	Anonymous	150	151	mg/L	98.6	70-130	
Water	MS	Chromium (Cr)-Total	WG1630674-8	Anonymous	0.0380	0.0401	mg/L	94.6	70-130	
Water	MS	Cobalt (Co)-Total	WG1630674-8	Anonymous	0.0190	0.0200	mg/L	95.1	70-130	
Water	MS	Copper (Cu)-Total	WG1630674-8	Anonymous	0.0188	0.0203	mg/L	92.5	70-130	
Water	MS	Iron (Fe)-Total	WG1630674-8	Anonymous	1.85	2.01	mg/L	92.4	70-130	
Water	MS	Lead (Pb)-Total	WG1630674-8	Anonymous	0.0189	0.0200	mg/L	94.6	70-130	
Water	MS	Lithium (Li)-Total	WG1630674-8	Anonymous	0.103	0.107	mg/L	96.0	70-130	
Water	MS	Magnesium (Mg)-Total	WG1630674-8	Anonymous	121	114	mg/L	106.4	70-130	
Water	MS	Manganese (Mn)-Total	WG1630674-8	Anonymous	0.0199	0.0205	mg/L	96.7	70-130	
Water	MS	Molybdenum (Mo)-Total	WG1630674-8	Anonymous	0.0228	0.0221	mg/L	103.3	70-130	
Water	MS	Nickel (Ni)-Total	WG1630674-8	Anonymous	0.0374	0.0400	mg/L	93.5	70-130	
Water	MS	Potassium (K)-Total	WG1630674-8	Anonymous	105	100	mg/L	104.6	70-130	
Water	MS	Selenium (Se)-Total	WG1630674-8	Anonymous	0.0428	0.0410	mg/L	104.5	70-130	
Water	MS	Silver (Ag)-Total	WG1630674-8	Anonymous	0.00404	0.00400	mg/L	100.9	70-130	
Water	MS	Sodium (Na)-Total	WG1630674-8	Anonymous	4.04	4.12	mg/L	N/A	-	MS-B
Water	MS	Strontium (Sr)-Total	WG1630674-8	Anonymous	0.129	0.136	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Total	WG1630674-8	Anonymous	0.00374	0.00400	mg/L	93.6	70-130	
Water	MS	Tin (Sn)-Total	WG1630674-8	Anonymous	0.0206	0.0200	mg/L	103.0	70-130	
Water	MS	Titanium (Ti)-Total	WG1630674-8	Anonymous	0.0405	0.0400	mg/L	101.2	70-130	
Water	MS	Uranium (U)-Total	WG1630674-8	Anonymous	0.00431	0.00441	mg/L	97.5	70-130	
Water	MS	Vanadium (V)-Total	WG1630674-8	Anonymous	0.0969	0.100	mg/L	96.9	70-130	
Water	MS	Zinc (Zn)-Total	WG1630674-8	Anonymous	0.384	0.400	mg/L	96.0	70-130	
Water	MS	Zirconium (Zr)-Total	WG1630674-8	Anonymous	0.0401	0.0400	mg/L	100.3	70-130	

Dissolved Metals

Water	CRM	Calcium (Ca)-Dissolved	WG1630672-2	VA-HIGH-WATRM	51.8	50.0	mg/L	103.6	80-120
Water	CRM	Magnesium (Mg)-Dissolved	WG1630672-2	VA-HIGH-WATRM	49.3	50.0	mg/L	98.6	80-120
Water	CRM	Phosphorus (P)-Dissolved	WG1630672-2	VA-HIGH-WATRM	2.42	2.50	mg/L	96.9	80-120
Water	CRM	Potassium (K)-Dissolved	WG1630672-2	VA-HIGH-WATRM	49.1	50.0	mg/L	98.2	80-120
Water	CRM	Silicon (Si)-Dissolved	WG1630672-2	VA-HIGH-WATRM	1.01	1.00	mg/L	100.9	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1635325-2		0.00495	0.00500	ug/L	98.9	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1635545-2		0.00522	0.00500	ug/L	104.4	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1635525-10		0.00517	0.00500	ug/L	103.3	80-120
Water	MB	Aluminum (Al)-Dissolved	WG1630672-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Dissolved	WG1630672-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Dissolved	WG1630672-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Dissolved	WG1630672-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Dissolved	WG1630672-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Dissolved	WG1630672-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Dissolved	WG1630672-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Dissolved	WG1630672-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Dissolved	WG1630672-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Dissolved	WG1630672-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Dissolved	WG1630672-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Dissolved	WG1630672-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Dissolved	WG1630672-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Dissolved	WG1630672-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Dissolved	WG1630672-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Dissolved	WG1630672-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Dissolved	WG1630672-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Dissolved	WG1630672-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Dissolved	WG1630672-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Dissolved	WG1630672-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Dissolved	WG1630672-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Dissolved	WG1630672-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Dissolved	WG1630672-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Dissolved	WG1630672-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Dissolved	WG1630672-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Dissolved	WG1630672-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Dissolved	WG1630672-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Dissolved	WG1630672-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Dissolved	WG1630672-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Dissolved	WG1630672-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Dissolved	WG1630672-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Dissolved	WG1630672-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Dissolved	WG1630672-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Mercury (Hg)-Dissolved	WG1631977-1		<0.0010	<0.001	ug/L	-	0.001
Water	MB	Mercury (Hg)-Dissolved	WG1631977-2		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-5		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-6		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-7		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-8		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-9		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1635325-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1635525-9		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1635545-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1631977-10		<0.0010	<0.001	ug/L	-	0.001
Water	MS	Mercury (Hg)-Dissolved	WG1635325-4	L1271152-1	0.00501	0.00500	ug/L	100.2	70-130
Water	MS	Mercury (Hg)-Dissolved	WG1635525-11	L1271152-17	0.00529	0.00500	ug/L	105.8	70-130

Aggregate Organics

Water	LCS	BOD	WG1630849-2	170	198	mg/L	85.9	85-115
Water	LCS	BOD	WG1630849-5	180	198	mg/L	90.9	85-115
Water	LCS	BOD	WG1630878-2	188	198	mg/L	95.1	85-115
Water	MB	BOD	WG1630849-1	<2.0	<2	mg/L	-	2
Water	MB	BOD	WG1630849-4	<2.0	<2	mg/L	-	2
Water	MB	BOD	WG1630878-1	<2.0	<2	mg/L	-	2

Project
Report To Mark Tinholt, TECK METALS LTD.
ALS File No. L1280396
Date Received 19-Mar-13 10:10
Date 01-Apr-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1280396-11	Water	WG1643365-34	Conductivity	147	147	uS/cm	0.1	10	-	-	-
L1280396-30	Water	WG1643365-35	Conductivity	148	149	uS/cm	0.2	10	-	-	-
L1280396-11	Water	WG1643365-34	pH	8.06	8.06	pH	-	-	0.00	0.3	J
L1280396-30	Water	WG1643365-35	pH	8.07	8.05	pH	-	-	0.01	0.3	J
L1280396-6	Water	WG1643231-12	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1280396-27	Water	WG1643231-15	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1280396-10	Water	WG1643837-6	Total Dissolved Solids	86	83	mg/L	3.3	20	-	-	-
L1280396-31	Water	WG1643837-9	Total Dissolved Solids	84	87	mg/L	3.5	20	-	-	-
L1280396-7	Water	WG1643655-6	Turbidity	0.42	0.44	NTU	2.8	15	-	-	-
L1280396-23	Water	WG1643655-9	Turbidity	2.39	2.43	NTU	1.7	15	-	-	-
Anions and Nutrients											
L1280396-15	Water	WG1643981-11	Alkalinity, Total (as CaCO3)	65.1	64.2	mg/L	1.4	20	-	-	-
L1280396-7	Water	WG1646575-15	Ammonia, Total (as N)	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1280396-33	Water	WG1646575-17	Ammonia, Total (as N)	0.0095	0.0104	mg/L	9.0	20	-	-	-
L1280396-9	Water	WG1643351-12	Bromide (Br)	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1280396-35	Water	WG1643351-15	Bromide (Br)	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1643351-12	Chloride (Cl)	0.89	0.89	mg/L	0.0	20	-	-	-
L1280396-35	Water	WG1643351-15	Chloride (Cl)	0.91	0.91	mg/L	0.1	20	-	-	-
L1280396-9	Water	WG1643351-12	Fluoride (F)	0.067	0.067	mg/L	0.3	20	-	-	-
L1280396-35	Water	WG1643351-15	Fluoride (F)	0.070	0.071	mg/L	0.8	20	-	-	-
L1280396-9	Water	WG1643351-12	Nitrate (as N)	0.147	0.146	mg/L	0.3	20	-	-	-
L1280396-35	Water	WG1643351-15	Nitrate (as N)	0.148	0.148	mg/L	0.0	20	-	-	-
L1280396-9	Water	WG1643351-12	Nitrite (as N)	<0.0010	<0.0010	mg/L	N/A	20	-	-	RPD-NA
L1280396-35	Water	WG1643351-15	Nitrite (as N)	<0.0010	<0.0010	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1643619-6	Total Kjeldahl Nitrogen	0.057	0.059	mg/L	3.5	20	-	-	-
L1280396-24	Water	WG1643793-3	Total Kjeldahl Nitrogen	0.080	0.078	mg/L	2.7	20	-	-	-
L1280396-35	Water	WG1643793-6	Total Kjeldahl Nitrogen	0.073	0.117	mg/L	-	-	0.044	0.1	J
L1280396-11	Water	WG1644120-7	Phosphorus (P)-Total Dissolved	0.0021	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1280396-11	Water	WG1644120-7	Phosphorus (P)-Total	0.0040	0.0039	mg/L	2.8	20	-	-	-
L1280396-31	Water	WG1644120-11	Phosphorus (P)-Total	0.0058	0.0055	mg/L	6.0	20	-	-	-
L1280396-9	Water	WG1643351-12	Sulfate (SO4)	11.9	11.9	mg/L	0.1	20	-	-	-
Organic / Inorganic Carbon											
L1280396-9	Water	WG1646197-14	Total Organic Carbon	1.18	1.18	mg/L	0.3	20	-	-	-
L1280396-25	Water	WG1647189-5	Total Organic Carbon	1.03	0.99	mg/L	3.5	20	-	-	-
Total Metals											
L1280396-1	Water	WG1645163-5	Mercury (Hg)-Total	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1280396-13	Water	WG1645163-7	Mercury (Hg)-Total	<0.0040	<0.0040	ug/L	N/A	20	-	-	RPD-NA
L1280396-30	Water	WG1645163-8	Mercury (Hg)-Total	<0.0010	<0.0010	ug/L	N/A	20	-	-	RPD-NA
Total Metals (Undigested)											
L1280396-9	Water	WG1642577-5	Aluminum (Al)-Total	0.00940	0.0104	mg/L	10	20	-	-	-
L1280396-9	Water	WG1642577-5	Antimony (Sb)-Total	0.000036	0.000035	mg/L	2.8	20	-	-	-
L1280396-9	Water	WG1642577-5	Arsenic (As)-Total	0.000212	0.000241	mg/L	13	20	-	-	-
L1280396-9	Water	WG1642577-5	Barium (Ba)-Total	0.0210	0.0211	mg/L	0.4	20	-	-	-
L1280396-9	Water	WG1642577-5	Beryllium (Be)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Bismuth (Bi)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Boron (B)-Total	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Cadmium (Cd)-Total	0.0000101	0.0000082	mg/L	-	-	0.0000019	0.00001	J
L1280396-9	Water	WG1642577-5	Calcium (Ca)-Total	20.7	20.4	mg/L	1.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Chromium (Cr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Cobalt (Co)-Total	0.0000087	0.0000099	mg/L	14	20	-	-	-
L1280396-9	Water	WG1642577-5	Copper (Cu)-Total	0.00028	0.00030	mg/L	8.8	20	-	-	-
L1280396-9	Water	WG1642577-5	Iron (Fe)-Total	0.0078	0.0076	mg/L	2.5	20	-	-	-
L1280396-9	Water	WG1642577-5	Lead (Pb)-Total	0.0000757	0.0000748	mg/L	1.2	20	-	-	-
L1280396-9	Water	WG1642577-5	Lithium (Li)-Total	0.00123	0.00116	mg/L	5.6	20	-	-	-
L1280396-9	Water	WG1642577-5	Magnesium (Mg)-Total	4.98	4.92	mg/L	1.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Manganese (Mn)-Total	0.00139	0.00149	mg/L	7.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Molybdenum (Mo)-Total	0.000500	0.000507	mg/L	1.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Nickel (Ni)-Total	0.000306	0.000316	mg/L	3.1	20	-	-	-
L1280396-9	Water	WG1642577-5	Phosphorus (P)-Total	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Potassium (K)-Total	0.640	0.659	mg/L	2.9	20	-	-	-
L1280396-9	Water	WG1642577-5	Selenium (Se)-Total	0.000227	0.000229	mg/L	1.1	20	-	-	-
L1280396-9	Water	WG1642577-5	Silicon (Si)-Total	2.10	2.05	mg/L	2.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Silver (Ag)-Total	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Sodium (Na)-Total	1.67	1.62	mg/L	3.0	20	-	-	-
L1280396-9	Water	WG1642577-5	Strontium (Sr)-Total	0.112	0.112	mg/L	0.3	20	-	-	-
L1280396-9	Water	WG1642577-5	Thallium (Tl)-Total	<0.0000020	<0.0000020	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Tin (Sn)-Total	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Titanium (Ti)-Total	<0.00050	0.00057	mg/L	N/A	20	-	-	RPD-NA
L1280396-9	Water	WG1642577-5	Uranium (U)-Total	0.000492	0.000497	mg/L	1.2	20	-	-	-
L1280396-9	Water	WG1642577-5	Vanadium (V)-Total	0.000103	0.000078	mg/L	-	-	0.000025	0.0001	J
L1280396-9	Water	WG1642577-5	Zinc (Zn)-Total	0.00092	0.00097	mg/L	6.2	20	-	-	-
L1280396-9	Water	WG1642577-5	Zirconium (Zr)-Total	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
Dissolved Metals											
L1280396-8	Water	WG1642578-10	Aluminum (Al)-Dissolved	0.00458	0.00443	mg/L	3.4	20	-	-	-
L1280396-29	Water	WG1642578-12	Aluminum (Al)-Dissolved	0.00462	0.00498	mg/L	7.5	20	-	-	-
L1280396-8	Water	WG1642578-10	Antimony (Sb)-Dissolved	0.000036	0.000035	mg/L	3.0	20	-	-	-
L1280396-29	Water	WG1642578-12	Antimony (Sb)-Dissolved	0.000053	0.000061	mg/L	14	20	-	-	-
L1280396-8	Water	WG1642578-10	Arsenic (As)-Dissolved	0.000215	0.000203	mg/L	5.3	20	-	-	-
L1280396-29	Water	WG1642578-12	Arsenic (As)-Dissolved	0.000247	0.000252	mg/L	2.1	20	-	-	-
L1280396-8	Water	WG1642578-10	Barium (Ba)-Dissolved	0.0208	0.0202	mg/L	3.1	20	-	-	-
L1280396-29	Water	WG1642578-12	Barium (Ba)-Dissolved	0.0211	0.0202	mg/L	4.3	20	-	-	-
L1280396-8	Water	WG1642578-10	Beryllium (Be)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Beryllium (Be)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Bismuth (Bi)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Boron (B)-Dissolved	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Boron (B)-Dissolved	<0.0050	<0.0050	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Cadmium (Cd)-Dissolved	0.0000057	0.0000055	mg/L	3.7	20	-	-	-
L1280396-29	Water	WG1642578-12	Cadmium (Cd)-Dissolved	0.0000203	0.0000173	mg/L	16	20	-	-	-
L1280396-8	Water	WG1642578-10	Calcium (Ca)-Dissolved	20.4	20.3	mg/L	0.1	20	-	-	-
L1280396-29	Water	WG1642578-12	Calcium (Ca)-Dissolved	20.9	20.8	mg/L	0.5	20	-	-	-
L1280396-8	Water	WG1642578-10	Chromium (Cr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Chromium (Cr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Cobalt (Co)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Cobalt (Co)-Dissolved	0.0000090	0.0000085	mg/L	5.6	20	-	-	-
L1280396-8	Water	WG1642578-10	Copper (Cu)-Dissolved	0.00022	0.00021	mg/L	4.2	20	-	-	-
L1280396-29	Water	WG1642578-12	Copper (Cu)-Dissolved	0.00024	0.00024	mg/L	1.0	20	-	-	-
L1280396-8	Water	WG1642578-10	Iron (Fe)-Dissolved	0.0017	0.0017	mg/L	0.1	20	-	-	-
L1280396-29	Water	WG1642578-12	Iron (Fe)-Dissolved	0.0019	0.0020	mg/L	3.6	20	-	-	-
L1280396-8	Water	WG1642578-10	Lead (Pb)-Dissolved	0.0000099	0.0000087	mg/L	13	20	-	-	-
L1280396-29	Water	WG1642578-12	Lead (Pb)-Dissolved	0.0000616	0.0000584	mg/L	5.3	20	-	-	-
L1280396-8	Water	WG1642578-10	Lithium (Li)-Dissolved	0.00118	0.00125	mg/L	5.9	20	-	-	-
L1280396-29	Water	WG1642578-12	Lithium (Li)-Dissolved	0.00135	0.00138	mg/L	2.1	20	-	-	-
L1280396-8	Water	WG1642578-10	Magnesium (Mg)-Dissolved	4.88	4.88	mg/L	0.1	20	-	-	-
L1280396-29	Water	WG1642578-12	Magnesium (Mg)-Dissolved	5.01	4.96	mg/L	1.0	20	-	-	-
L1280396-8	Water	WG1642578-10	Manganese (Mn)-Dissolved	0.000625	0.000671	mg/L	7.1	20	-	-	-
L1280396-29	Water	WG1642578-12	Manganese (Mn)-Dissolved	0.00196	0.00180	mg/L	8.7	20	-	-	-
L1280396-12	Water	WG1645163-9	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1280396-22	Water	WG1645168-3	Mercury (Hg)-Dissolved	<0.0020	<0.0020	ug/L	N/A	20	-	-	RPD-NA

L1280396-34	Water	WG1645168-4	Mercury (Hg)-Dissolved	<0.012	<0.012	ug/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Molybdenum (Mo)-Dissolved	0.000485	0.000523	mg/L	7.6	20	-	-	-
L1280396-29	Water	WG1642578-12	Molybdenum (Mo)-Dissolved	0.000505	0.000497	mg/L	1.7	20	-	-	-
L1280396-8	Water	WG1642578-10	Nickel (Ni)-Dissolved	0.000281	0.000299	mg/L	6.4	20	-	-	-
L1280396-29	Water	WG1642578-12	Nickel (Ni)-Dissolved	0.000297	0.000287	mg/L	3.7	20	-	-	-
L1280396-8	Water	WG1642578-10	Phosphorus (P)-Dissolved	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Phosphorus (P)-Dissolved	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Potassium (K)-Dissolved	0.625	0.637	mg/L	1.9	20	-	-	-
L1280396-29	Water	WG1642578-12	Potassium (K)-Dissolved	0.660	0.662	mg/L	0.3	20	-	-	-
L1280396-8	Water	WG1642578-10	Selenium (Se)-Dissolved	0.000224	0.000239	mg/L	6.2	20	-	-	-
L1280396-29	Water	WG1642578-12	Selenium (Se)-Dissolved	0.000217	0.000220	mg/L	1.4	20	-	-	-
L1280396-8	Water	WG1642578-10	Silicon (Si)-Dissolved	2.04	2.05	mg/L	0.6	20	-	-	-
L1280396-29	Water	WG1642578-12	Silicon (Si)-Dissolved	2.13	2.13	mg/L	0.3	20	-	-	-
L1280396-8	Water	WG1642578-10	Silver (Ag)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Silver (Ag)-Dissolved	<0.0000050	<0.0000050	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Sodium (Na)-Dissolved	1.65	1.59	mg/L	3.8	20	-	-	-
L1280396-29	Water	WG1642578-12	Sodium (Na)-Dissolved	1.75	1.67	mg/L	4.7	20	-	-	-
L1280396-8	Water	WG1642578-10	Strontium (Sr)-Dissolved	0.110	0.109	mg/L	0.4	20	-	-	-
L1280396-29	Water	WG1642578-12	Strontium (Sr)-Dissolved	0.111	0.109	mg/L	1.7	20	-	-	-
L1280396-8	Water	WG1642578-10	Thallium (Tl)-Dissolved	<0.0000020	<0.0000020	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Thallium (Tl)-Dissolved	<0.0000020	<0.0000020	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Tin (Sn)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Tin (Sn)-Dissolved	<0.000010	<0.000010	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Titanium (Ti)-Dissolved	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Titanium (Ti)-Dissolved	<0.00050	<0.00050	mg/L	N/A	20	-	-	RPD-NA
L1280396-8	Water	WG1642578-10	Uranium (U)-Dissolved	0.000490	0.000498	mg/L	1.6	20	-	-	-
L1280396-29	Water	WG1642578-12	Uranium (U)-Dissolved	0.000522	0.000485	mg/L	7.2	20	-	-	-
L1280396-8	Water	WG1642578-10	Vanadium (V)-Dissolved	0.000088	0.000084	mg/L	4.7	20	-	-	-
L1280396-29	Water	WG1642578-12	Vanadium (V)-Dissolved	0.000088	0.000079	mg/L	11	20	-	-	-
L1280396-8	Water	WG1642578-10	Zinc (Zn)-Dissolved	0.00112	0.00108	mg/L	3.8	20	-	-	-
L1280396-29	Water	WG1642578-12	Zinc (Zn)-Dissolved	0.00174	0.00128	mg/L	-	-	0.00045	0.001	J
L1280396-8	Water	WG1642578-10	Zirconium (Zr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA
L1280396-29	Water	WG1642578-12	Zirconium (Zr)-Dissolved	<0.00010	<0.00010	mg/L	N/A	20	-	-	RPD-NA

Aggregate Organics

L1280396-1	Water	WG1643425-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
L1280396-12	Water	WG1643700-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
L1280396-13	Water	WG1644086-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
L1280396-20	Water	WG1644354-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA

Anions and Nutrients

L1280396-35	Water	WG1643351-15	Sulfate (SO4)	12.4	12.4	mg/L	0.1	20	-	-	-

Project	
Report To	Mark Tinholt, TECK METALS LTD.
ALS File No.	L1280396
Date Received	19-Mar-13 10:10
Date	01-Apr-13

QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1643655-2	VA-TURB-SPK-8	8.08	8.00	NTU	101.0	85-115	
Water	CRM	Turbidity	WG1643655-5	VA-TURB-SPK-8	8.29	8.00	NTU	103.6	85-115	
Water	CRM	Turbidity	WG1643655-8	VA-TURB-SPK-8	8.20	8.00	NTU	102.5	85-115	
Water	CRM	pH	WG1644376-1	VA-PH7-BUF	6.98	7.00	pH	6.98	6.9-7.1	
Water	CRM	Conductivity	WG1643365-17	VA-EC-PCT-CONTROL	146	147	uS/cm	99.1	90-110	
Water	CRM	Conductivity	WG1643365-18	VA-EC-PCT-CONTROL	142	147	uS/cm	96.8	90-110	
Water	CRM	Conductivity	WG1643365-19	VA-EC-PCT-CONTROL	144	147	uS/cm	97.9	90-110	
Water	CRM	Conductivity	WG1643365-20	VA-EC-PCT-CONTROL	145	147	uS/cm	98.8	90-110	
Water	CRM	Conductivity	WG1643365-21	VA-EC-PCT-CONTROL	145	147	uS/cm	98.8	90-110	
Water	CRM	Conductivity	WG1643365-22	VA-EC-PCT-CONTROL	144	147	uS/cm	98.2	90-110	
Water	CRM	Conductivity	WG1643365-23	VA-EC-PCT-CONTROL	145	147	uS/cm	98.9	90-110	
Water	CRM	pH	WG1643365-24	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1643365-25	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1643365-26	VA-PH7-BUF	7.04	7.00	pH	7.04	6.9-7.1	
Water	CRM	pH	WG1643365-27	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1643365-28	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1643365-29	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1643365-30	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	Turbidity	WG1643655-11	VA-TURB-SPK-8	8.06	8.00	NTU	100.8	85-115	
Water	CRM	Turbidity	WG1643655-14	VA-TURB-SPK-8	8.21	8.00	NTU	102.6	85-115	
Water	CRM	Turbidity	WG1643655-17	VA-TURB-SPK-8	8.12	8.00	NTU	101.5	85-115	
Water	LCS	Total Suspended Solids	WG1643231-2		65.3	75.0	mg/L	87.1	85-115	
Water	LCS	Total Suspended Solids	WG1643231-5		74.3	75.0	mg/L	99.1	85-115	
Water	LCS	Total Suspended Solids	WG1643231-8		71.6	75.0	mg/L	95.5	85-115	
Water	LCS	Total Dissolved Solids	WG1643837-2		426	425	mg/L	100.2	85-115	
Water	LCS	Total Dissolved Solids	WG1643837-5		426	425	mg/L	100.1	85-115	
Water	LCS	Total Dissolved Solids	WG1643837-8		399	425	mg/L	93.9	85-115	
Water	LCS	Total Suspended Solids	WG1643231-11		76.0	75.0	mg/L	101.3	85-115	
Water	LCS	Total Suspended Solids	WG1643231-14		84.2	75.0	mg/L	112.3	85-115	
Water	LCS	Total Dissolved Solids	WG1643837-11		417	425	mg/L	98.2	85-115	
Water	MB	Total Suspended Solids	WG1643231-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1643231-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1643231-7		<3.0	<3	mg/L	-	3	
Water	MB	Conductivity	WG1643365-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-7		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1643365-8		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1643655-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1643655-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1643655-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1643837-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1643837-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1643837-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1643231-10		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1643231-13		<3.0	<3	mg/L	-	3	
Water	MB	Turbidity	WG1643655-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1643655-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1643655-16		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1643837-10		<10	<10	mg/L	-	10	
Anions and Nutrients										
Water	CRM	Alkalinity, Total (as CaCO3)	WG1643981-2	VA-ALKL-CONTROL	14.4	15.0	mg/L	95.9	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1643981-5	VA-ALKM-CONTROL	70.3	75.0	mg/L	93.8	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1643981-8	VA-ALKH-CONTROL	260	250	mg/L	103.9	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1644120-2	VA-ERA-PO4	4.30	3.99	mg/L	107.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1644120-2	VA-ERA-PO4	4.17	3.99	mg/L	104.6	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1644120-6	VA-ERA-PO4	4.38	3.99	mg/L	109.8	80-120	
Water	CRM	Phosphorus (P)-Total	WG1644120-6	VA-ERA-PO4	4.37	3.99	mg/L	109.6	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1646474-2	VA-ERA-PO4	4.35	3.99	mg/L	109.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1646474-2	VA-ERA-PO4	4.39	3.99	mg/L	110.1	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1646474-6	VA-ERA-PO4	4.42	3.99	mg/L	110.9	80-120	
Water	CRM	Phosphorus (P)-Total	WG1646474-6	VA-ERA-PO4	4.52	3.99	mg/L	113.2	80-120	
Water	CRM	Ammonia, Total (as N)	WG1646575-2	VA-NH3-F	0.124	0.120	mg/L	103.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1646575-4	VA-NH3-F	0.122	0.120	mg/L	101.8	85-115	
Water	CRM	Ammonia, Total (as N)	WG1646575-6	VA-NH3-F	0.124	0.120	mg/L	103.6	85-115	
Water	CRM	Ammonia, Total (as N)	WG1646575-8	VA-NH3-F	0.125	0.120	mg/L	103.8	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1644120-10	VA-ERA-PO4	4.28	3.99	mg/L	107.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1644120-10	VA-ERA-PO4	4.69	3.99	mg/L	117.5	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1644120-14	VA-ERA-PO4	4.76	3.99	mg/L	119.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1644120-14	VA-ERA-PO4	4.25	3.99	mg/L	106.5	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1646474-10	VA-ERA-PO4	4.51	3.99	mg/L	113.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1646474-10	VA-ERA-PO4	4.49	3.99	mg/L	112.5	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1646474-14	VA-ERA-PO4	4.54	3.99	mg/L	113.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1646474-14	VA-ERA-PO4	4.54	3.99	mg/L	113.8	80-120	
Water	CRM	Ammonia, Total (as N)	WG1646575-10	VA-NH3-F	0.125	0.120	mg/L	104.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1646575-12	VA-NH3-F	0.124	0.120	mg/L	102.9	85-115	
Water	CRM	Ammonia, Total (as N)	WG1646575-14	VA-NH3-F	0.128	0.120	mg/L	106.3	85-115	
Water	LCS	Bromide (Br)	WG1643351-2		0.504	0.500	mg/L	100.7	85-115	
Water	LCS	Chloride (Cl)	WG1643351-2		102	100	mg/L	102.3	85-115	
Water	LCS	Fluoride (F)	WG1643351-2		1.07	1.00	mg/L	107.5	85-115	
Water	LCS	Nitrate (as N)	WG1643351-2		2.58	2.50	mg/L	103.0	85-115	
Water	LCS	Nitrite (as N)	WG1643351-2		0.513	0.500	mg/L	102.7	85-115	
Water	LCS	Sulfate (SO4)	WG1643351-2		102	100	mg/L	102.3	85-115	
Water	LCS	Total Kjeldahl Nitrogen	WG1643619-2		1.01	1.00	mg/L	100.5	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1643619-5		1.02	1.00	mg/L	102.3	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1643793-2		1.04	1.00	mg/L	104.1	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1643793-5		1.02	1.00	mg/L	101.8	75-125	

Water	LCS	Total Kjeldahl Nitrogen	WG1644476-2		1.04	1.00	mg/L	103.7	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1644476-5		1.02	1.00	mg/L	101.5	75-125
Water	LCS	Bromide (Br)	WG1643351-18		0.506	0.500	mg/L	101.2	85-115
Water	LCS	Chloride (Cl)	WG1643351-18		102	100	mg/L	102.3	85-115
Water	LCS	Fluoride (F)	WG1643351-18		1.08	1.00	mg/L	107.6	85-115
Water	LCS	Nitrate (as N)	WG1643351-18		2.59	2.50	mg/L	103.4	85-115
Water	LCS	Nitrite (as N)	WG1643351-18		0.513	0.500	mg/L	102.6	85-115
Water	LCS	Sulfate (SO4)	WG1643351-18		102	100	mg/L	102.3	85-115
Water	MB	Bromide (Br)	WG1643351-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-1		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1643351-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-4		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-4		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-4		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1643351-7		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-7		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-7		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Kjeldahl Nitrogen	WG1643619-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1643619-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1643793-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1643793-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Alkalinity, Total (as CaCO3)	WG1643981-1		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1643981-4		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1643981-7		<2.0	<2	mg/L	-	2
Water	MB	Phosphorus (P)-Total	WG1644120-1		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total Dissolved	WG1644120-5		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1644120-5		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Total Kjeldahl Nitrogen	WG1644476-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1644476-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Phosphorus (P)-Total Dissolved	WG1646474-1		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1646474-1		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1646474-5		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total Dissolved	WG1646474-9		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1646474-9		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Ammonia, Total (as N)	WG1646575-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1646575-3		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1646575-5		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1646575-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1646575-9		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Bromide (Br)	WG1643351-10		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-10		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-10		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-10		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-10		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-10		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1643351-13		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-13		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-13		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-13		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-13		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-13		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1643351-16		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1643351-16		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1643351-16		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1643351-16		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1643351-16		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1643351-16		<0.50	<0.5	mg/L	-	0.5
Water	MB	Phosphorus (P)-Total	WG1644120-13		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1646474-13		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Ammonia, Total (as N)	WG1646575-11		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1646575-13		<0.0050	<0.005	mg/L	-	0.005
Water	MS	Bromide (Br)	WG1643351-5	Anonymous	0.501	0.500	mg/L	100.2	75-125
Water	MS	Chloride (Cl)	WG1643351-5	Anonymous	103	101	mg/L	102.6	75-125
Water	MS	Fluoride (F)	WG1643351-5	Anonymous	1.12	1.00	mg/L	111.5	75-125
Water	MS	Nitrate (as N)	WG1643351-5	Anonymous	2.60	2.52	mg/L	103.2	75-125
Water	MS	Nitrite (as N)	WG1643351-5	Anonymous	0.518	0.503	mg/L	103.0	75-125
Water	MS	Sulfate (SO4)	WG1643351-5	Anonymous	123	124	mg/L	99.7	75-125
Water	MS	Bromide (Br)	WG1643351-8	Anonymous	0.499	0.500	mg/L	99.8	75-125
Water	MS	Chloride (Cl)	WG1643351-8	Anonymous	101	100	mg/L	100.6	75-125
Water	MS	Fluoride (F)	WG1643351-8	Anonymous	1.08	1.00	mg/L	108.3	75-125
Water	MS	Nitrate (as N)	WG1643351-8	Anonymous	2.53	2.50	mg/L	101.2	75-125
Water	MS	Nitrite (as N)	WG1643351-8	Anonymous	0.506	0.500	mg/L	101.2	75-125
Water	MS	Sulfate (SO4)	WG1643351-8	Anonymous	101	100	mg/L	100.7	75-125
Water	MS	Phosphorus (P)-Total Dissolved	WG1644120-4	Anonymous	0.0485	0.0500	mg/L	97.1	70-130
Water	MS	Phosphorus (P)-Total	WG1644120-4	Anonymous	0.0493	0.0500	mg/L	98.5	70-130
Water	MS	Phosphorus (P)-Total Dissolved	WG1644120-8	L1280396-12	0.0508	0.0500	mg/L	101.5	70-130
Water	MS	Phosphorus (P)-Total	WG1644120-8	L1280396-12	0.0491	0.0533	mg/L	91.5	70-130
Water	MS	Phosphorus (P)-Total	WG1646474-4	Anonymous	0.0571	0.0560	mg/L	102.2	70-130
Water	MS	Phosphorus (P)-Total	WG1646474-8	Anonymous	0.0521	0.0530	mg/L	98.2	70-130
Water	MS	Chloride (Cl)	WG1643351-11	Anonymous	100	101	mg/L	99.7	75-125
Water	MS	Fluoride (F)	WG1643351-11	Anonymous	1.17	1.10	mg/L	106.6	75-125
Water	MS	Nitrate (as N)	WG1643351-11	Anonymous	2.70	2.71	mg/L	99.7	75-125
Water	MS	Nitrite (as N)	WG1643351-11	Anonymous	0.495	0.500	mg/L	98.9	75-125
Water	MS	Sulfate (SO4)	WG1643351-11	Anonymous	129	133	mg/L	95.5	75-125
Water	MS	Bromide (Br)	WG1643351-14	L1280396-9	0.501	0.500	mg/L	100.2	75-125
Water	MS	Chloride (Cl)	WG1643351-14	L1280396-9	102	101	mg/L	101.4	75-125
Water	MS	Fluoride (F)	WG1643351-14	L1280396-9	1.16	1.07	mg/L	109.0	75-125
Water	MS	Nitrate (as N)	WG1643351-14	L1280396-9	2.69	2.65	mg/L	101.5	75-125
Water	MS	Nitrite (as N)	WG1643351-14	L1280396-9	0.507	0.500	mg/L	101.4	75-125
Water	MS	Sulfate (SO4)	WG1643351-14	L1280396-9	112	112	mg/L	99.9	75-125
Water	MS	Bromide (Br)	WG1643351-17	L1280396-35	0.508	0.500	mg/L	101.6	75-125
Water	MS	Chloride (Cl)	WG1643351-17	L1280396-35	103	101	mg/L	102.4	75-125
Water	MS	Fluoride (F)	WG1643351-17	L1280396-35	1.17	1.07	mg/L	110.1	75-125
Water	MS	Nitrate (as N)	WG1643351-17	L1280396-35	2.71	2.65	mg/L	102.6	75-125

Water	MS	Nitrite (as N)	WG1643351-17	L1280396-35	0.512	0.500	mg/L	102.5	75-125	
Water	MS	Sulfate (SO4)	WG1643351-17	L1280396-35	113	112	mg/L	100.9	75-125	
Water	MS	Phosphorus (P)-Total Dissolved	WG1644120-12	L1280396-32	0.0495	0.0540	mg/L	90.9	70-130	
Water	MS	Phosphorus (P)-Total	WG1644120-12	L1280396-32	0.0509	0.0558	mg/L	90.1	70-130	
Water	MS	Phosphorus (P)-Total	WG1644120-16	Anonymous	0.0541	0.0536	mg/L	101.0	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1646474-12	Anonymous	0.0555	0.0538	mg/L	103.4	70-130	
Water	MS	Phosphorus (P)-Total	WG1646474-16	Anonymous	0.548	0.553	mg/L	N/A	-	MS-B
Water	MS	Ammonia, Total (as N)	WG1646575-16	L1280396-7	0.198	0.200	mg/L	99.1	75-125	
Water	MS	Ammonia, Total (as N)	WG1646575-18	L1280396-33	0.237	0.210	mg/L	113.9	75-125	
Organic / Inorganic Carbon										
Water	LCS	Total Organic Carbon	WG1646197-1		8.79	8.57	mg/L	102.6	80-120	
Water	LCS	Total Organic Carbon	WG1646197-5		8.83	8.57	mg/L	103.0	80-120	
Water	LCS	Total Organic Carbon	WG1646197-9		8.45	8.57	mg/L	98.6	80-120	
Water	LCS	Total Organic Carbon	WG1646827-1		8.85	8.57	mg/L	103.3	80-120	
Water	LCS	Total Organic Carbon	WG1646827-4		8.67	8.57	mg/L	101.2	80-120	
Water	LCS	Total Organic Carbon	WG1646827-8		8.76	8.57	mg/L	102.2	80-120	
Water	LCS	Total Organic Carbon	WG1647189-1		8.76	8.57	mg/L	102.3	80-120	
Water	LCS	Total Organic Carbon	WG1647189-4		8.48	8.57	mg/L	98.9	80-120	
Water	LCS	Total Organic Carbon	WG1647189-8		8.60	8.57	mg/L	100.4	80-120	
Water	LCS	Total Organic Carbon	WG1646197-13		8.77	8.57	mg/L	102.3	80-120	
Water	LCS	Total Organic Carbon	WG1646197-17		8.62	8.57	mg/L	100.6	80-120	
Water	LCS	Total Organic Carbon	WG1646827-12		8.75	8.57	mg/L	102.1	80-120	
Water	LCS	Total Organic Carbon	WG1646827-16		8.75	8.57	mg/L	102.1	80-120	
Water	LCS	Total Organic Carbon	WG1647189-11		8.66	8.57	mg/L	101.1	80-120	
Water	LCS	Total Organic Carbon	WG1647189-15		8.49	8.57	mg/L	99.0	80-120	
Water	MB	Total Organic Carbon	WG1646197-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646197-8		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646827-3		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646827-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1647189-3		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1647189-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646197-12		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646197-16		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646827-11		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1646827-15		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1647189-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1647189-14		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Total Organic Carbon	WG1646827-6	Anonymous	8.63	8.52	mg/L	102.3	70-130	
Water	MS	Total Organic Carbon	WG1647189-6	L1280396-31	6.15	6.08	mg/L	101.4	70-130	
Water	MS	Total Organic Carbon	WG1646827-10	Anonymous	5.43	5.00	mg/L	108.5	70-130	
Water	MS	Total Organic Carbon	WG1646827-14	L1280396-16	6.58	6.37	mg/L	104.1	70-130	
Water	MS	Total Organic Carbon	WG1647189-13	Anonymous	9.77	9.47	mg/L	106.0	70-130	
Total Metals										
Water	LCS	Mercury (Hg)-Total	WG1645163-2		0.00520	0.00500	ug/L	104.0	80-120	
Water	LCS	Mercury (Hg)-Total	WG1645168-2		0.00464	0.00500	ug/L	92.9	80-120	
Water	MB	Mercury (Hg)-Total	WG1645163-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1645168-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Total	WG1645163-3	Anonymous	0.00506	0.00500	ug/L	101.2	70-130	
Water	MS	Mercury (Hg)-Total	WG1645163-6	L1280396-12	0.00577	0.00500	ug/L	115.4	70-130	
Total Metals (Undigested)										
Water	CRM	Calcium (Ca)-Total	WG1642577-2	VA-HIGH-WATRM	53.9	50.0	mg/L	107.7	80-120	
Water	CRM	Calcium (Ca)-Total	WG1642577-2	VA-HIGH-WATRM	53.9	50.0	mg/L	107.7	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1642577-2	VA-HIGH-WATRM	54.5	50.0	mg/L	109.0	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1642577-2	VA-HIGH-WATRM	54.5	50.0	mg/L	109.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1642577-2	VA-HIGH-WATRM	2.57	2.50	mg/L	102.9	80-120	
Water	CRM	Phosphorus (P)-Total	WG1642577-2	VA-HIGH-WATRM	2.57	2.50	mg/L	102.9	80-120	
Water	CRM	Potassium (K)-Total	WG1642577-2	VA-HIGH-WATRM	53.6	50.0	mg/L	107.2	80-120	
Water	CRM	Potassium (K)-Total	WG1642577-2	VA-HIGH-WATRM	53.6	50.0	mg/L	107.2	80-120	
Water	CRM	Silicon (Si)-Total	WG1642577-2	VA-HIGH-WATRM	1.05	1.00	mg/L	105.5	80-120	
Water	CRM	Silicon (Si)-Total	WG1642577-2	VA-HIGH-WATRM	1.05	1.00	mg/L	105.5	80-120	
Water	MB	Aluminum (Al)-Total	WG1642577-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Total	WG1642577-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Total	WG1642577-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Total	WG1642577-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Total	WG1642577-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Total	WG1642577-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Total	WG1642577-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Total	WG1642577-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Total	WG1642577-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Calcium (Ca)-Total	WG1642577-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Total	WG1642577-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Total	WG1642577-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Total	WG1642577-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Total	WG1642577-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Total	WG1642577-1		0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Total	WG1642577-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Total	WG1642577-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Magnesium (Mg)-Total	WG1642577-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Total	WG1642577-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Total	WG1642577-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Total	WG1642577-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Phosphorus (P)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Total	WG1642577-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silicon (Si)-Total	WG1642577-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Total	WG1642577-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Total	WG1642577-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Total	WG1642577-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Total	WG1642577-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Total	WG1642577-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Total	WG1642577-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Total	WG1642577-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Total	WG1642577-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Total	WG1642577-1		<0.00050	<0.0005	mg/L	-	0.0005	

Water	MB	Zirconium (Zr)-Total	WG1642577-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MS	Aluminum (Al)-Total	WG1642577-6	L1280396-13	0.206	0.210	mg/L	98.0	70-130	
Water	MS	Antimony (Sb)-Total	WG1642577-6	L1280396-13	0.0206	0.0200	mg/L	102.9	70-130	
Water	MS	Arsenic (As)-Total	WG1642577-6	L1280396-13	0.0219	0.0202	mg/L	108.1	70-130	
Water	MS	Barium (Ba)-Total	WG1642577-6	L1280396-13	0.0415	0.0414	mg/L	N/A	-	MS-B
Water	MS	Beryllium (Be)-Total	WG1642577-6	L1280396-13	0.0390	0.0400	mg/L	97.4	70-130	
Water	MS	Bismuth (Bi)-Total	WG1642577-6	L1280396-13	0.00923	0.0100	mg/L	92.3	70-130	
Water	MS	Boron (B)-Total	WG1642577-6	L1280396-13	0.0958	0.100	mg/L	95.8	70-130	
Water	MS	Cadmium (Cd)-Total	WG1642577-6	L1280396-13	0.00401	0.00401	mg/L	99.9	70-130	
Water	MS	Calcium (Ca)-Total	WG1642577-6	L1280396-13	121	122	mg/L	99.3	70-130	
Water	MS	Chromium (Cr)-Total	WG1642577-6	L1280396-13	0.0387	0.0400	mg/L	96.9	70-130	
Water	MS	Cobalt (Co)-Total	WG1642577-6	L1280396-13	0.0193	0.0200	mg/L	96.6	70-130	
Water	MS	Copper (Cu)-Total	WG1642577-6	L1280396-13	0.0195	0.0203	mg/L	96.0	70-130	
Water	MS	Iron (Fe)-Total	WG1642577-6	L1280396-13	1.94	2.01	mg/L	96.5	70-130	
Water	MS	Lead (Pb)-Total	WG1642577-6	L1280396-13	0.0194	0.0201	mg/L	96.7	70-130	
Water	MS	Lithium (Li)-Total	WG1642577-6	L1280396-13	0.0899	0.101	mg/L	88.6	70-130	
Water	MS	Magnesium (Mg)-Total	WG1642577-6	L1280396-13	104	105	mg/L	99.6	70-130	
Water	MS	Manganese (Mn)-Total	WG1642577-6	L1280396-13	0.0207	0.0215	mg/L	96.0	70-130	
Water	MS	Molybdenum (Mo)-Total	WG1642577-6	L1280396-13	0.0209	0.0205	mg/L	101.9	70-130	
Water	MS	Nickel (Ni)-Total	WG1642577-6	L1280396-13	0.0390	0.0403	mg/L	96.7	70-130	
Water	MS	Potassium (K)-Total	WG1642577-6	L1280396-13	102	101	mg/L	101.0	70-130	
Water	MS	Selenium (Se)-Total	WG1642577-6	L1280396-13	0.0428	0.0402	mg/L	106.4	70-130	
Water	MS	Silver (Ag)-Total	WG1642577-6	L1280396-13	0.00386	0.00400	mg/L	96.6	70-130	
Water	MS	Sodium (Na)-Total	WG1642577-6	L1280396-13	3.47	3.63	mg/L	92.4	70-130	
Water	MS	Strontium (Sr)-Total	WG1642577-6	L1280396-13	0.130	0.135	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Total	WG1642577-6	L1280396-13	0.00388	0.00400	mg/L	96.9	70-130	
Water	MS	Tin (Sn)-Total	WG1642577-6	L1280396-13	0.0198	0.0200	mg/L	99.0	70-130	
Water	MS	Titanium (Ti)-Total	WG1642577-6	L1280396-13	0.0433	0.0400	mg/L	108.4	70-130	
Water	MS	Uranium (U)-Total	WG1642577-6	L1280396-13	0.00450	0.00449	mg/L	100.2	70-130	
Water	MS	Vanadium (V)-Total	WG1642577-6	L1280396-13	0.0991	0.100	mg/L	99.0	70-130	
Water	MS	Zinc (Zn)-Total	WG1642577-6	L1280396-13	0.382	0.401	mg/L	95.2	70-130	
Water	MS	Zirconium (Zr)-Total	WG1642577-6	L1280396-13	0.0403	0.0400	mg/L	100.9	70-130	
Dissolved Metals										
Water	CRM	Aluminum (Al)-Dissolved	WG1642578-2	VA-HIGH-WATRM	1.91	2.00	mg/L	95.6	80-120	
Water	CRM	Antimony (Sb)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.949	1.00	mg/L	94.9	80-120	
Water	CRM	Arsenic (As)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.940	1.00	mg/L	94.0	80-120	
Water	CRM	Barium (Ba)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.236	0.250	mg/L	94.4	80-120	
Water	CRM	Beryllium (Be)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.0921	0.100	mg/L	92.1	80-120	
Water	CRM	Bismuth (Bi)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.914	1.00	mg/L	91.4	80-120	
Water	CRM	Boron (B)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.87	1.00	mg/L	86.7	80-120	
Water	CRM	Cadmium (Cd)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.0957	0.100	mg/L	95.7	80-120	
Water	CRM	Calcium (Ca)-Dissolved	WG1642578-2	VA-HIGH-WATRM	51.3	50.0	mg/L	102.6	80-120	
Water	CRM	Calcium (Ca)-Dissolved	WG1642578-2	VA-HIGH-WATRM	51.3	50.0	mg/L	102.6	80-120	
Water	CRM	Chromium (Cr)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.236	0.250	mg/L	94.5	80-120	
Water	CRM	Cobalt (Co)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.231	0.250	mg/L	92.2	80-120	
Water	CRM	Copper (Cu)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.225	0.250	mg/L	90.2	80-120	
Water	CRM	Iron (Fe)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.902	1.00	mg/L	90.2	80-120	
Water	CRM	Lead (Pb)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.458	0.500	mg/L	91.6	80-120	
Water	CRM	Lithium (Li)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.237	0.250	mg/L	94.7	80-120	
Water	CRM	Magnesium (Mg)-Dissolved	WG1642578-2	VA-HIGH-WATRM	53.0	50.0	mg/L	105.9	80-120	
Water	CRM	Magnesium (Mg)-Dissolved	WG1642578-2	VA-HIGH-WATRM	53.0	50.0	mg/L	105.9	80-120	
Water	CRM	Manganese (Mn)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.231	0.250	mg/L	92.5	80-120	
Water	CRM	Molybdenum (Mo)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.239	0.250	mg/L	95.4	80-120	
Water	CRM	Nickel (Ni)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.472	0.500	mg/L	94.5	80-120	
Water	CRM	Phosphorus (P)-Dissolved	WG1642578-2	VA-HIGH-WATRM	2.55	2.50	mg/L	101.9	80-120	
Water	CRM	Phosphorus (P)-Dissolved	WG1642578-2	VA-HIGH-WATRM	2.55	2.50	mg/L	101.9	80-120	
Water	CRM	Potassium (K)-Dissolved	WG1642578-2	VA-HIGH-WATRM	50.7	50.0	mg/L	101.4	80-120	
Water	CRM	Potassium (K)-Dissolved	WG1642578-2	VA-HIGH-WATRM	50.7	50.0	mg/L	101.4	80-120	
Water	CRM	Selenium (Se)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.920	1.00	mg/L	92.0	80-120	
Water	CRM	Silicon (Si)-Dissolved	WG1642578-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.2	80-120	
Water	CRM	Silicon (Si)-Dissolved	WG1642578-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.2	80-120	
Water	CRM	Silver (Ag)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.0949	0.100	mg/L	94.9	80-120	
Water	CRM	Sodium (Na)-Dissolved	WG1642578-2	VA-HIGH-WATRM	46.9	50.0	mg/L	93.9	80-120	
Water	CRM	Strontium (Sr)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.232	0.250	mg/L	92.9	80-120	
Water	CRM	Thallium (Tl)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.923	1.00	mg/L	92.3	80-120	
Water	CRM	Tin (Sn)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.468	0.500	mg/L	93.7	80-120	
Water	CRM	Titanium (Ti)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.217	0.250	mg/L	86.8	80-120	
Water	CRM	Uranium (U)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.00465	0.00500	mg/L	93.0	80-120	
Water	CRM	Vanadium (V)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.468	0.500	mg/L	93.6	80-120	
Water	CRM	Zinc (Zn)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.455	0.500	mg/L	90.9	80-120	
Water	CRM	Zirconium (Zr)-Dissolved	WG1642578-2	VA-HIGH-WATRM	0.100	0.100	mg/L	100.4	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1645163-2		0.00520	0.00500	ug/L	104.0	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1645168-2		0.00464	0.00500	ug/L	92.9	80-120	
Water	MB	Aluminum (Al)-Dissolved	WG1642578-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Dissolved	WG1642578-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Dissolved	WG1642578-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Dissolved	WG1642578-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Dissolved	WG1642578-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Dissolved	WG1642578-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Dissolved	WG1642578-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Dissolved	WG1642578-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Dissolved	WG1642578-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Calcium (Ca)-Dissolved	WG1642578-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Dissolved	WG1642578-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Dissolved	WG1642578-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Dissolved	WG1642578-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Dissolved	WG1642578-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Dissolved	WG1642578-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Dissolved	WG1642578-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Dissolved	WG1642578-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Magnesium (Mg)-Dissolved	WG1642578-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Dissolved	WG1642578-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Dissolved	WG1642578-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Dissolved	WG1642578-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Phosphorus (P)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Dissolved	WG1642578-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silicon (Si)-Dissolved	WG1642578-1		<0.050	<0.05	mg/L	-	0.05	

Water	MB	Silver (Ag)-Dissolved	WG1642578-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Dissolved	WG1642578-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Dissolved	WG1642578-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Dissolved	WG1642578-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Dissolved	WG1642578-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Dissolved	WG1642578-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Dissolved	WG1642578-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Dissolved	WG1642578-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Dissolved	WG1642578-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Dissolved	WG1642578-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Mercury (Hg)-Dissolved	WG1645163-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-2		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-4		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-5		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-6		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-7		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645167-8		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1645168-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Dissolved	WG1645163-4	Anonymous	0.00540	0.00500	ug/L	108.0	70-130	
Water	MS	Aluminum (Al)-Dissolved	WG1642578-11	L1280396-4	0.198	0.205	mg/L	96.6	70-130	
Water	MS	Antimony (Sb)-Dissolved	WG1642578-11	L1280396-4	0.0206	0.0200	mg/L	102.9	70-130	
Water	MS	Arsenic (As)-Dissolved	WG1642578-11	L1280396-4	0.0215	0.0202	mg/L	106.1	70-130	
Water	MS	Barium (Ba)-Dissolved	WG1642578-11	L1280396-4	0.0404	0.0403	mg/L	N/A	-	MS-B
Water	MS	Beryllium (Be)-Dissolved	WG1642578-11	L1280396-4	0.0394	0.0400	mg/L	98.4	70-130	
Water	MS	Bismuth (Bi)-Dissolved	WG1642578-11	L1280396-4	0.00935	0.0100	mg/L	93.5	70-130	
Water	MS	Boron (B)-Dissolved	WG1642578-11	L1280396-4	0.0936	0.100	mg/L	93.6	70-130	
Water	MS	Cadmium (Cd)-Dissolved	WG1642578-11	L1280396-4	0.00391	0.00401	mg/L	97.4	70-130	
Water	MS	Calcium (Ca)-Dissolved	WG1642578-11	L1280396-4	124	120	mg/L	103.3	70-130	
Water	MS	Chromium (Cr)-Dissolved	WG1642578-11	L1280396-4	0.0384	0.0400	mg/L	96.1	70-130	
Water	MS	Cobalt (Co)-Dissolved	WG1642578-11	L1280396-4	0.0192	0.0200	mg/L	95.9	70-130	
Water	MS	Copper (Cu)-Dissolved	WG1642578-11	L1280396-4	0.0193	0.0203	mg/L	95.2	70-130	
Water	MS	Iron (Fe)-Dissolved	WG1642578-11	L1280396-4	1.92	2.00	mg/L	96.0	70-130	
Water	MS	Lead (Pb)-Dissolved	WG1642578-11	L1280396-4	0.0191	0.0200	mg/L	95.4	70-130	
Water	MS	Lithium (Li)-Dissolved	WG1642578-11	L1280396-4	0.0932	0.101	mg/L	92.0	70-130	
Water	MS	Magnesium (Mg)-Dissolved	WG1642578-11	L1280396-4	105	105	mg/L	99.8	70-130	
Water	MS	Manganese (Mn)-Dissolved	WG1642578-11	L1280396-4	0.0202	0.0208	mg/L	97.1	70-130	
Water	MS	Molybdenum (Mo)-Dissolved	WG1642578-11	L1280396-4	0.0207	0.0205	mg/L	100.9	70-130	
Water	MS	Nickel (Ni)-Dissolved	WG1642578-11	L1280396-4	0.0384	0.0403	mg/L	95.1	70-130	
Water	MS	Potassium (K)-Dissolved	WG1642578-11	L1280396-4	105	101	mg/L	104.8	70-130	
Water	MS	Selenium (Se)-Dissolved	WG1642578-11	L1280396-4	0.0434	0.0402	mg/L	108.1	70-130	
Water	MS	Silver (Ag)-Dissolved	WG1642578-11	L1280396-4	0.00393	0.00400	mg/L	98.3	70-130	
Water	MS	Sodium (Na)-Dissolved	WG1642578-11	L1280396-4	3.53	3.62	mg/L	95.4	70-130	
Water	MS	Strontium (Sr)-Dissolved	WG1642578-11	L1280396-4	0.129	0.133	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Dissolved	WG1642578-11	L1280396-4	0.00388	0.00400	mg/L	97.0	70-130	
Water	MS	Tin (Sn)-Dissolved	WG1642578-11	L1280396-4	0.0196	0.0200	mg/L	97.8	70-130	
Water	MS	Titanium (Ti)-Dissolved	WG1642578-11	L1280396-4	0.0389	0.0400	mg/L	97.3	70-130	
Water	MS	Uranium (U)-Dissolved	WG1642578-11	L1280396-4	0.00446	0.00449	mg/L	99.4	70-130	
Water	MS	Vanadium (V)-Dissolved	WG1642578-11	L1280396-4	0.0965	0.100	mg/L	96.4	70-130	
Water	MS	Zinc (Zn)-Dissolved	WG1642578-11	L1280396-4	0.380	0.401	mg/L	94.7	70-130	
Water	MS	Zirconium (Zr)-Dissolved	WG1642578-11	L1280396-4	0.0419	0.0400	mg/L	104.9	70-130	
Water	MS	Aluminum (Al)-Dissolved	WG1642578-13	L1280396-32	0.191	0.205	mg/L	93.2	70-130	
Water	MS	Antimony (Sb)-Dissolved	WG1642578-13	L1280396-32	0.0209	0.0201	mg/L	103.9	70-130	
Water	MS	Arsenic (As)-Dissolved	WG1642578-13	L1280396-32	0.0214	0.0202	mg/L	105.9	70-130	
Water	MS	Barium (Ba)-Dissolved	WG1642578-13	L1280396-32	0.0410	0.0407	mg/L	N/A	-	MS-B
Water	MS	Beryllium (Be)-Dissolved	WG1642578-13	L1280396-32	0.0389	0.0400	mg/L	97.2	70-130	
Water	MS	Bismuth (Bi)-Dissolved	WG1642578-13	L1280396-32	0.00945	0.0100	mg/L	94.5	70-130	
Water	MS	Boron (B)-Dissolved	WG1642578-13	L1280396-32	0.0956	0.100	mg/L	95.6	70-130	
Water	MS	Cadmium (Cd)-Dissolved	WG1642578-13	L1280396-32	0.00395	0.00403	mg/L	98.1	70-130	
Water	MS	Calcium (Ca)-Dissolved	WG1642578-13	L1280396-32	123	121	mg/L	102.6	70-130	
Water	MS	Chromium (Cr)-Dissolved	WG1642578-13	L1280396-32	0.0369	0.0400	mg/L	92.3	70-130	
Water	MS	Cobalt (Co)-Dissolved	WG1642578-13	L1280396-32	0.0189	0.0200	mg/L	94.6	70-130	
Water	MS	Copper (Cu)-Dissolved	WG1642578-13	L1280396-32	0.0192	0.0203	mg/L	94.5	70-130	
Water	MS	Iron (Fe)-Dissolved	WG1642578-13	L1280396-32	1.90	2.00	mg/L	94.8	70-130	
Water	MS	Lead (Pb)-Dissolved	WG1642578-13	L1280396-32	0.0195	0.0200	mg/L	97.4	70-130	
Water	MS	Lithium (Li)-Dissolved	WG1642578-13	L1280396-32	0.0894	0.101	mg/L	88.1	70-130	
Water	MS	Magnesium (Mg)-Dissolved	WG1642578-13	L1280396-32	107	105	mg/L	102.0	70-130	
Water	MS	Manganese (Mn)-Dissolved	WG1642578-13	L1280396-32	0.0198	0.0211	mg/L	93.9	70-130	
Water	MS	Molybdenum (Mo)-Dissolved	WG1642578-13	L1280396-32	0.0212	0.0205	mg/L	103.3	70-130	
Water	MS	Nickel (Ni)-Dissolved	WG1642578-13	L1280396-32	0.0379	0.0403	mg/L	94.0	70-130	
Water	MS	Potassium (K)-Dissolved	WG1642578-13	L1280396-32	106	101	mg/L	105.5	70-130	
Water	MS	Selenium (Se)-Dissolved	WG1642578-13	L1280396-32	0.0415	0.0403	mg/L	103.0	70-130	
Water	MS	Silver (Ag)-Dissolved	WG1642578-13	L1280396-32	0.00387	0.00400	mg/L	96.8	70-130	
Water	MS	Sodium (Na)-Dissolved	WG1642578-13	L1280396-32	3.43	3.70	mg/L	86.8	70-130	
Water	MS	Strontium (Sr)-Dissolved	WG1642578-13	L1280396-32	0.131	0.128	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Dissolved	WG1642578-13	L1280396-32	0.00396	0.00401	mg/L	98.8	70-130	
Water	MS	Tin (Sn)-Dissolved	WG1642578-13	L1280396-32	0.0199	0.0200	mg/L	99.3	70-130	
Water	MS	Titanium (Ti)-Dissolved	WG1642578-13	L1280396-32	0.0405	0.0400	mg/L	101.3	70-130	
Water	MS	Uranium (U)-Dissolved	WG1642578-13	L1280396-32	0.00452	0.00450	mg/L	100.5	70-130	
Water	MS	Vanadium (V)-Dissolved	WG1642578-13	L1280396-32	0.0960	0.100	mg/L	95.9	70-130	
Water	MS	Zinc (Zn)-Dissolved	WG1642578-13	L1280396-32	0.365	0.402	mg/L	90.7	70-130	
Water	MS	Zirconium (Zr)-Dissolved	WG1642578-13	L1280396-32	0.0420	0.0400	mg/L	105.1	70-130	
Water	MS	Mercury (Hg)-Dissolved	WG1645163-10	L1280396-28	0.00463	0.00500	ug/L	92.5	70-130	
Aggregate Organics										
Water	LCS	BOD	WG1643425-2		217	198	mg/L	109.3	85-115	
Water	LCS	BOD	WG1643425-5		210	198	mg/L	106.1	85-115	
Water	LCS	BOD	WG1643700-2		206	198	mg/L	104.2	85-115	
Water	LCS	BOD	WG1644086-2		208	198	mg/L	105.1	85-115	
Water	LCS	BOD	WG1644086-5		219	198	mg/L	110.7	85-115	
Water	LCS	BOD	WG1644354-2		216	198	mg/L	108.8	85-115	
Water	LCS	BOD	WG1644692-2		214	198	mg/L	107.9	85-115	
Water	LCS	BOD	WG1644692-5		216	198	mg/L	108.9	85-115	
Water	LCS	BOD	WG1646290-2		189	198	mg/L	95.6	85-115	
Water	LCS	BOD	WG1646290-5		196	198	mg/L	98.9	85-115	
Water	MB	BOD	WG1643425-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1643425-4		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1643700-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1644086-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1644086-4		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1644354-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1644692-1		<2.0	<2	mg/L	-	2	

Water	MB	BOD	WG1644692-4	<2.0	<2	mg/L	-	2
Water	MB	BOD	WG1646290-1	<2.0	<2	mg/L	-	2
Water	MB	BOD	WG1646290-4	<2.0	<2	mg/L	-	2

Project	AREMP
Report To	Mark Tinholt, TECK METALS LTD.
ALS File No.	L1284870
Date Received	02-Apr-13 10:50
Date	12-Apr-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1284870-2	Water	WG1650376-6	Total Dissolved Solids	84	83	mg/L	0.3	20	-	-	-
Anions and Nutrients											
L1284870-1	Water	WG1649482-22	Alkalinity, Total (as CaCO3)	61.2	60.4	mg/L	1.3	20	-	-	-
L1284870-2	Water	WG1649689-7	Phosphorus (P)-Total Dissolved	0.0025	0.0022	mg/L	13	20	-	-	-
L1284870-2	Water	WG1649689-7	Phosphorus (P)-Total	0.0028	0.0028	mg/L	0.0	20	-	-	-
Total Metals											
L1284870-2	Water	WG1650578-8	Mercury (Hg)-Total	<0.0010	<0.0010	ug/L	N/A	20	-	-	RPD-NA

Project AREMP
Report To Mark Tinholt, TECK METALS LTD.
ALS File No. L1284870
Date Received 02-Apr-13 10:50
Date 12-Apr-13

QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1649630-2	VA-TURB-SPK-8	8.20	8.00	NTU	102.5	85-115	
Water	CRM	Turbidity	WG1649630-5	VA-TURB-SPK-8	8.08	8.00	NTU	101.0	85-115	
Water	CRM	Conductivity	WG1649550-17	VA-EC-PCT-CONTROL	147	147	uS/cm	99.9	90-110	
Water	CRM	Conductivity	WG1649550-18	VA-EC-PCT-CONTROL	144	147	uS/cm	97.9	90-110	
Water	CRM	Conductivity	WG1649550-19	VA-EC-PCT-CONTROL	146	147	uS/cm	99.6	90-110	
Water	CRM	Conductivity	WG1649550-20	VA-EC-PCT-CONTROL	149	147	uS/cm	101.4	90-110	
Water	CRM	pH	WG1649550-24	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1649550-25	VA-PH7-BUF	7.04	7.00	pH	7.04	6.9-7.1	
Water	CRM	pH	WG1649550-26	VA-PH7-BUF	7.04	7.00	pH	7.04	6.9-7.1	
Water	CRM	pH	WG1649550-27	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	LCS	Total Suspended Solids	WG1649974-2		70.2	75.0	mg/L	93.6	85-115	
Water	LCS	Total Suspended Solids	WG1649974-5		72.4	75.0	mg/L	96.5	85-115	
Water	LCS	Total Suspended Solids	WG1649974-8		72.6	75.0	mg/L	96.8	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-2		425	425	mg/L	100.0	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-5		430	425	mg/L	101.1	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-8		439	425	mg/L	103.4	85-115	
Water	LCS	Total Suspended Solids	WG1649974-11		70.8	75.0	mg/L	94.4	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-11		427	425	mg/L	100.4	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-14		431	425	mg/L	101.4	85-115	
Water	LCS	Total Dissolved Solids	WG1650376-17		417	425	mg/L	98.2	85-115	
Water	MB	Conductivity	WG1649550-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1649550-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1649550-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1649550-4		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1649630-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1649630-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Suspended Solids	WG1649974-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1649974-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1649974-7		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1650376-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1650376-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1650376-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1649974-10		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1650376-10		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1650376-13		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1650376-16		<10	<10	mg/L	-	10	
Anions and Nutrients										
Water	CRM	Alkalinity, Total (as CaCO3)	WG1649482-2	VA-ALKL-CONTROL	14.7	15.0	mg/L	97.7	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1649482-5	VA-ALKM-CONTROL	70.8	75.0	mg/L	94.4	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1649482-8	VA-ALKH-CONTROL	243	250	mg/L	97.1	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1649689-2	VA-ERA-PO4	4.37	3.99	mg/L	109.4	80-120	
Water	CRM	Phosphorus (P)-Total	WG1649689-2	VA-ERA-PO4	4.19	3.99	mg/L	105.1	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1649689-6	VA-ERA-PO4	4.40	3.99	mg/L	110.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1649689-6	VA-ERA-PO4	4.21	3.99	mg/L	105.6	80-120	
Water	CRM	Ammonia, Total (as N)	WG1651380-2	VA-NH3-F	0.122	0.120	mg/L	101.9	85-115	
Water	CRM	Ammonia, Total (as N)	WG1651380-4	VA-NH3-F	0.113	0.120	mg/L	94.6	85-115	
Water	CRM	Ammonia, Total (as N)	WG1651380-6	VA-NH3-F	0.116	0.120	mg/L	96.8	85-115	
Water	CRM	Ammonia, Total (as N)	WG1651380-8	VA-NH3-F	0.119	0.120	mg/L	98.8	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1649689-10	VA-ERA-PO4	4.35	3.99	mg/L	109.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1649689-10	VA-ERA-PO4	4.27	3.99	mg/L	106.9	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1649689-14	VA-ERA-PO4	4.40	3.99	mg/L	110.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1649689-14	VA-ERA-PO4	4.29	3.99	mg/L	107.5	80-120	
Water	CRM	Ammonia, Total (as N)	WG1651380-10	VA-NH3-F	0.119	0.120	mg/L	98.9	85-115	
Water	LCS	Bromide (Br)	WG1649516-2		0.504	0.500	mg/L	100.8	85-115	
Water	LCS	Chloride (Cl)	WG1649516-2		104	100	mg/L	104.0	85-115	
Water	LCS	Fluoride (F)	WG1649516-2		1.09	1.00	mg/L	108.8	85-115	
Water	LCS	Nitrate (as N)	WG1649516-2		2.61	2.50	mg/L	104.5	85-115	
Water	LCS	Nitrite (as N)	WG1649516-2		0.519	0.500	mg/L	103.7	85-115	
Water	LCS	Sulfate (SO4)	WG1649516-2		104	100	mg/L	103.9	85-115	
Water	LCS	Total Kjeldahl Nitrogen	WG1649873-2		0.791	1.00	mg/L	79.1	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1649873-5		0.934	1.00	mg/L	93.4	75-125	
Water	LCS	Bromide (Br)	WG1649516-17		0.515	0.500	mg/L	103.0	85-115	
Water	LCS	Chloride (Cl)	WG1649516-17		104	100	mg/L	104.2	85-115	
Water	LCS	Fluoride (F)	WG1649516-17		1.09	1.00	mg/L	108.5	85-115	
Water	LCS	Nitrate (as N)	WG1649516-17		2.62	2.50	mg/L	104.8	85-115	
Water	LCS	Nitrite (as N)	WG1649516-17		0.526	0.500	mg/L	105.2	85-115	
Water	LCS	Sulfate (SO4)	WG1649516-17		104	100	mg/L	104.1	85-115	
Water	MB	Alkalinity, Total (as CaCO3)	WG1649482-1		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1649482-4		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1649482-7		<2.0	<2	mg/L	-	2	
Water	MB	Bromide (Br)	WG1649516-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-1		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1649516-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-4		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-4		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-4		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1649516-7		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-7		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-7		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1649689-1		<0.0020	<0.002	mg/L	-	0.002	

Water	MB	Phosphorus (P)-Total	WG1649689-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1649689-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1649689-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1649689-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1649689-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Total Kjeldahl Nitrogen	WG1649873-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1649873-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Ammonia, Total (as N)	WG1651380-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1651380-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1651380-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1651380-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1651380-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Bromide (Br)	WG1649516-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1649516-12		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-12		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-12		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-12		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-12		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-12		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1649516-15		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1649516-15		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1649516-15		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1649516-15		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1649516-15		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1649516-15		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1649689-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1649689-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MS	Chloride (Cl)	WG1649516-5	Anonymous	101	100	mg/L	100.9	75-125	
Water	MS	Fluoride (F)	WG1649516-5	Anonymous	1.08	1.00	mg/L	108.0	75-125	
Water	MS	Nitrate (as N)	WG1649516-5	Anonymous	2.54	2.50	mg/L	101.5	75-125	
Water	MS	Nitrite (as N)	WG1649516-5	Anonymous	0.505	0.500	mg/L	101.0	75-125	
Water	MS	Sulfate (SO4)	WG1649516-5	Anonymous	101	100	mg/L	101.0	75-125	
Water	MS	Chloride (Cl)	WG1649516-8	Anonymous	102	101	mg/L	101.3	75-125	
Water	MS	Fluoride (F)	WG1649516-8	Anonymous	1.13	1.00	mg/L	113.0	75-125	
Water	MS	Nitrate (as N)	WG1649516-8	Anonymous	2.89	2.88	mg/L	100.2	75-125	
Water	MS	Nitrite (as N)	WG1649516-8	Anonymous	0.509	0.503	mg/L	101.4	75-125	
Water	MS	Sulfate (SO4)	WG1649516-8	Anonymous	103	102	mg/L	101.4	75-125	
Water	MS	Phosphorus (P)-Total	WG1649689-4	Anonymous	0.133	0.139	mg/L	N/A	-	MS-B
Water	MS	Phosphorus (P)-Total Dissolved	WG1649689-8	L1284870-3	0.0499	0.0500	mg/L	99.9	70-130	
Water	MS	Phosphorus (P)-Total	WG1649689-8	L1284870-3	0.0519	0.0533	mg/L	97.1	70-130	
Water	MS	Bromide (Br)	WG1649516-11	Anonymous	0.497	0.500	mg/L	99.4	75-125	
Water	MS	Chloride (Cl)	WG1649516-11	Anonymous	102	100	mg/L	101.8	75-125	
Water	MS	Fluoride (F)	WG1649516-11	Anonymous	1.09	1.00	mg/L	109.5	75-125	
Water	MS	Nitrate (as N)	WG1649516-11	Anonymous	2.56	2.50	mg/L	102.4	75-125	
Water	MS	Nitrite (as N)	WG1649516-11	Anonymous	0.512	0.500	mg/L	102.3	75-125	
Water	MS	Sulfate (SO4)	WG1649516-11	Anonymous	102	100	mg/L	102.0	75-125	
Water	MS	Bromide (Br)	WG1649516-16	Anonymous	0.507	0.500	mg/L	101.4	75-125	
Water	MS	Fluoride (F)	WG1649516-16	Anonymous	1.12	1.00	mg/L	111.8	75-125	
Water	MS	Nitrate (as N)	WG1649516-16	Anonymous	2.59	2.50	mg/L	103.5	75-125	
Water	MS	Nitrite (as N)	WG1649516-16	Anonymous	0.518	0.500	mg/L	103.5	75-125	
Water	MS	Sulfate (SO4)	WG1649516-16	Anonymous	103	100	mg/L	102.9	75-125	
Water	MS	Phosphorus (P)-Total	WG1649689-12	Anonymous	0.0512	0.0537	mg/L	94.9	70-130	
Water	MS	Phosphorus (P)-Total	WG1649689-16	Anonymous	0.0659	0.0665	mg/L	98.7	70-130	
Water	MS	Ammonia, Total (as N)	WG1651380-12	Anonymous	0.191	0.200	mg/L	95.4	75-125	
Water	MS	Ammonia, Total (as N)	WG1651380-14	Anonymous	0.198	0.207	mg/L	95.3	75-125	
Water	MS	Ammonia, Total (as N)	WG1651380-16	Anonymous	0.237	0.252	mg/L	92.2	75-125	
Organic / Inorganic Carbon										
Water	LCS	Total Organic Carbon	WG1651476-1		8.94	8.57	mg/L	104.3	80-120	
Water	LCS	Total Organic Carbon	WG1651476-4		8.16	8.57	mg/L	95.2	80-120	
Water	LCS	Total Organic Carbon	WG1651476-8		7.39	8.57	mg/L	86.2	80-120	
Water	LCS	Total Organic Carbon	WG1651476-11		7.49	8.57	mg/L	87.4	80-120	
Water	MB	Total Organic Carbon	WG1651476-3		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1651476-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1651476-10		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Total Organic Carbon	WG1651476-6	Anonymous	6.67	7.25	mg/L	88.4	70-130	
Total Metals										
Water	LCS	Mercury (Hg)-Total	WG1650578-3		0.00477	0.00500	ug/L	95.3	80-120	
Water	LCS	Mercury (Hg)-Total	WG1650578-4		0.00480	0.00500	ug/L	96.0	80-120	
Water	MB	Mercury (Hg)-Total	WG1650578-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1650578-2		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Total	WG1650578-5	Anonymous	0.00536	0.00500	ug/L	107.3	70-130	
Total Metals (Undigested)										
Water	CRM	Aluminum (Al)-Total	WG1649317-2	VA-HIGH-WATRM	1.97	2.00	mg/L	98.6	80-120	
Water	CRM	Antimony (Sb)-Total	WG1649317-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.0	80-120	
Water	CRM	Arsenic (As)-Total	WG1649317-2	VA-HIGH-WATRM	0.994	1.00	mg/L	99.4	80-120	
Water	CRM	Barium (Ba)-Total	WG1649317-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.6	80-120	
Water	CRM	Beryllium (Be)-Total	WG1649317-2	VA-HIGH-WATRM	0.0970	0.100	mg/L	97.0	80-120	
Water	CRM	Bismuth (Bi)-Total	WG1649317-2	VA-HIGH-WATRM	0.978	1.00	mg/L	97.8	80-120	
Water	CRM	Boron (B)-Total	WG1649317-2	VA-HIGH-WATRM	0.90	1.00	mg/L	90.1	80-120	
Water	CRM	Cadmium (Cd)-Total	WG1649317-2	VA-HIGH-WATRM	0.100	0.100	mg/L	100.0	80-120	
Water	CRM	Calcium (Ca)-Total	WG1649317-2	VA-HIGH-WATRM	51.2	50.0	mg/L	102.4	80-120	
Water	CRM	Chromium (Cr)-Total	WG1649317-2	VA-HIGH-WATRM	0.242	0.250	mg/L	96.7	80-120	
Water	CRM	Cobalt (Co)-Total	WG1649317-2	VA-HIGH-WATRM	0.237	0.250	mg/L	94.8	80-120	
Water	CRM	Copper (Cu)-Total	WG1649317-2	VA-HIGH-WATRM	0.233	0.250	mg/L	93.3	80-120	
Water	CRM	Iron (Fe)-Total	WG1649317-2	VA-HIGH-WATRM	0.906	1.00	mg/L	90.6	80-120	
Water	CRM	Lead (Pb)-Total	WG1649317-2	VA-HIGH-WATRM	0.488	0.500	mg/L	97.5	80-120	
Water	CRM	Lithium (Li)-Total	WG1649317-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.2	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1649317-2	VA-HIGH-WATRM	50.8	50.0	mg/L	101.7	80-120	
Water	CRM	Manganese (Mn)-Total	WG1649317-2	VA-HIGH-WATRM	0.241	0.250	mg/L	96.4	80-120	
Water	CRM	Molybdenum (Mo)-Total	WG1649317-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.2	80-120	
Water	CRM	Nickel (Ni)-Total	WG1649317-2	VA-HIGH-WATRM	0.474	0.500	mg/L	94.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1649317-2	VA-HIGH-WATRM	2.54	2.50	mg/L	101.5	80-120	

Water	CRM	Potassium (K)-Total	WG1649317-2	VA-HIGH-WATRM	50.7	50.0	mg/L	101.4	80-120
Water	CRM	Selenium (Se)-Total	WG1649317-2	VA-HIGH-WATRM	0.983	1.00	mg/L	98.3	80-120
Water	CRM	Silicon (Si)-Total	WG1649317-2	VA-HIGH-WATRM	0.992	1.00	mg/L	99.2	80-120
Water	CRM	Silver (Ag)-Total	WG1649317-2	VA-HIGH-WATRM	0.0989	0.100	mg/L	98.9	80-120
Water	CRM	Sodium (Na)-Total	WG1649317-2	VA-HIGH-WATRM	48.8	50.0	mg/L	97.6	80-120
Water	CRM	Strontium (Sr)-Total	WG1649317-2	VA-HIGH-WATRM	0.242	0.250	mg/L	96.8	80-120
Water	CRM	Thallium (Tl)-Total	WG1649317-2	VA-HIGH-WATRM	0.981	1.00	mg/L	98.1	80-120
Water	CRM	Tin (Sn)-Total	WG1649317-2	VA-HIGH-WATRM	0.488	0.500	mg/L	97.6	80-120
Water	CRM	Titanium (Ti)-Total	WG1649317-2	VA-HIGH-WATRM	0.241	0.250	mg/L	96.4	80-120
Water	CRM	Uranium (U)-Total	WG1649317-2	VA-HIGH-WATRM	0.00489	0.00500	mg/L	97.9	80-120
Water	CRM	Vanadium (V)-Total	WG1649317-2	VA-HIGH-WATRM	0.485	0.500	mg/L	97.0	80-120
Water	CRM	Zinc (Zn)-Total	WG1649317-2	VA-HIGH-WATRM	0.471	0.500	mg/L	94.3	80-120
Water	CRM	Zirconium (Zr)-Total	WG1649317-2	VA-HIGH-WATRM	0.0964	0.100	mg/L	96.4	80-120
Water	MB	Aluminum (Al)-Total	WG1649317-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Total	WG1649317-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Total	WG1649317-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Total	WG1649317-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Total	WG1649317-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Total	WG1649317-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Total	WG1649317-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Total	WG1649317-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Total	WG1649317-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Total	WG1649317-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Total	WG1649317-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Total	WG1649317-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Total	WG1649317-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Total	WG1649317-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Total	WG1649317-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Total	WG1649317-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Total	WG1649317-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Total	WG1649317-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Total	WG1649317-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Total	WG1649317-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Total	WG1649317-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Total	WG1649317-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Total	WG1649317-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Total	WG1649317-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Total	WG1649317-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Total	WG1649317-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Total	WG1649317-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Total	WG1649317-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Total	WG1649317-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Total	WG1649317-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Total	WG1649317-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Total	WG1649317-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Total	WG1649317-1		<0.00010	<0.0001	mg/L	-	0.0001
Dissolved Metals									
Water	CRM	Aluminum (Al)-Dissolved	WG1649304-2	VA-HIGH-WATRM	1.95	2.00	mg/L	97.4	80-120
Water	CRM	Antimony (Sb)-Dissolved	WG1649304-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.0	80-120
Water	CRM	Arsenic (As)-Dissolved	WG1649304-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.4	80-120
Water	CRM	Barium (Ba)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.250	0.250	mg/L	100.0	80-120
Water	CRM	Beryllium (Be)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.0993	0.100	mg/L	99.3	80-120
Water	CRM	Bismuth (Bi)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.979	1.00	mg/L	97.9	80-120
Water	CRM	Boron (B)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.91	1.00	mg/L	91.5	80-120
Water	CRM	Cadmium (Cd)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.102	0.100	mg/L	102.4	80-120
Water	CRM	Calcium (Ca)-Dissolved	WG1649304-2	VA-HIGH-WATRM	51.0	50.0	mg/L	102.1	80-120
Water	CRM	Chromium (Cr)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.248	0.250	mg/L	99.4	80-120
Water	CRM	Cobalt (Co)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.1	80-120
Water	CRM	Copper (Cu)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.241	0.250	mg/L	96.2	80-120
Water	CRM	Iron (Fe)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.921	1.00	mg/L	92.1	80-120
Water	CRM	Lead (Pb)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.490	0.500	mg/L	98.0	80-120
Water	CRM	Lithium (Li)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.251	0.250	mg/L	100.2	80-120
Water	CRM	Magnesium (Mg)-Dissolved	WG1649304-2	VA-HIGH-WATRM	50.9	50.0	mg/L	101.8	80-120
Water	CRM	Manganese (Mn)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.0	80-120
Water	CRM	Molybdenum (Mo)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.3	80-120
Water	CRM	Nickel (Ni)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.482	0.500	mg/L	96.4	80-120
Water	CRM	Phosphorus (P)-Dissolved	WG1649304-2	VA-HIGH-WATRM	2.55	2.50	mg/L	101.9	80-120
Water	CRM	Potassium (K)-Dissolved	WG1649304-2	VA-HIGH-WATRM	50.6	50.0	mg/L	101.1	80-120
Water	CRM	Selenium (Se)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.994	1.00	mg/L	99.4	80-120
Water	CRM	Silicon (Si)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.994	1.00	mg/L	99.4	80-120
Water	CRM	Silver (Ag)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.0997	0.100	mg/L	99.7	80-120
Water	CRM	Sodium (Na)-Dissolved	WG1649304-2	VA-HIGH-WATRM	49.7	50.0	mg/L	99.4	80-120
Water	CRM	Strontium (Sr)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.247	0.250	mg/L	98.8	80-120
Water	CRM	Thallium (Tl)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.986	1.00	mg/L	98.6	80-120
Water	CRM	Tin (Sn)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.497	0.500	mg/L	99.3	80-120
Water	CRM	Titanium (Ti)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.250	0.250	mg/L	99.9	80-120
Water	CRM	Uranium (U)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.00493	0.00500	mg/L	98.6	80-120
Water	CRM	Vanadium (V)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.493	0.500	mg/L	98.7	80-120
Water	CRM	Zinc (Zn)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.486	0.500	mg/L	97.2	80-120
Water	CRM	Zirconium (Zr)-Dissolved	WG1649304-2	VA-HIGH-WATRM	0.0981	0.100	mg/L	98.1	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1650578-3		0.00477	0.00500	ug/L	95.3	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1650578-4		0.00480	0.00500	ug/L	96.0	80-120
Water	MB	Aluminum (Al)-Dissolved	WG1649304-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Dissolved	WG1649304-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Dissolved	WG1649304-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Dissolved	WG1649304-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Dissolved	WG1649304-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Dissolved	WG1649304-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Dissolved	WG1649304-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Dissolved	WG1649304-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Dissolved	WG1649304-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Dissolved	WG1649304-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Dissolved	WG1649304-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Iron (Fe)-Dissolved	WG1649304-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Dissolved	WG1649304-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Dissolved	WG1649304-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Dissolved	WG1649304-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Dissolved	WG1649304-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Dissolved	WG1649304-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Dissolved	WG1649304-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Dissolved	WG1649304-1		<0.050	<0.05	mg/L	-	0.05

Water	MB	Potassium (K)-Dissolved	WG1649304-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Dissolved	WG1649304-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Dissolved	WG1649304-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Dissolved	WG1649304-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Dissolved	WG1649304-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Dissolved	WG1649304-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Dissolved	WG1649304-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Dissolved	WG1649304-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Dissolved	WG1649304-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Dissolved	WG1649304-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Dissolved	WG1649304-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Dissolved	WG1649304-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Dissolved	WG1649304-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Mercury (Hg)-Dissolved	WG1650578-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1650578-2		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Aluminum (Al)-Dissolved	WG1649304-6	L1284870-1	0.235	0.207	mg/L	114.1	70-130	
Water	MS	Antimony (Sb)-Dissolved	WG1649304-6	L1284870-1	0.0209	0.0200	mg/L	104.3	70-130	
Water	MS	Arsenic (As)-Dissolved	WG1649304-6	L1284870-1	0.0252	0.0202	mg/L	125.1	70-130	
Water	MS	Barium (Ba)-Dissolved	WG1649304-6	L1284870-1	0.0459	0.0399	mg/L	129.6	70-130	
Water	MS	Beryllium (Be)-Dissolved	WG1649304-6	L1284870-1	0.0414	0.0400	mg/L	103.4	70-130	
Water	MS	Bismuth (Bi)-Dissolved	WG1649304-6	L1284870-1	0.00944	0.0100	mg/L	94.4	70-130	
Water	MS	Boron (B)-Dissolved	WG1649304-6	L1284870-1	0.0954	0.100	mg/L	95.4	70-130	
Water	MS	Cadmium (Cd)-Dissolved	WG1649304-6	L1284870-1	0.00457	0.00401	mg/L	114.0	70-130	
Water	MS	Calcium (Ca)-Dissolved	WG1649304-6	L1284870-1	126	120	mg/L	105.9	70-130	
Water	MS	Chromium (Cr)-Dissolved	WG1649304-6	L1284870-1	0.0454	0.0400	mg/L	113.5	70-130	
Water	MS	Cobalt (Co)-Dissolved	WG1649304-6	L1284870-1	0.0223	0.0200	mg/L	111.4	70-130	
Water	MS	Copper (Cu)-Dissolved	WG1649304-6	L1284870-1	0.0224	0.0203	mg/L	110.4	70-130	
Water	MS	Iron (Fe)-Dissolved	WG1649304-6	L1284870-1	1.97	2.00	mg/L	98.7	70-130	
Water	MS	Lead (Pb)-Dissolved	WG1649304-6	L1284870-1	0.0203	0.0200	mg/L	101.3	70-130	
Water	MS	Lithium (Li)-Dissolved	WG1649304-6	L1284870-1	0.103	0.101	mg/L	102.5	70-130	
Water	MS	Magnesium (Mg)-Dissolved	WG1649304-6	L1284870-1	108	105	mg/L	103.4	70-130	
Water	MS	Manganese (Mn)-Dissolved	WG1649304-6	L1284870-1	0.0236	0.0207	mg/L	114.2	70-130	
Water	MS	Molybdenum (Mo)-Dissolved	WG1649304-6	L1284870-1	0.0202	0.0205	mg/L	98.8	70-130	
Water	MS	Nickel (Ni)-Dissolved	WG1649304-6	L1284870-1	0.0449	0.0403	mg/L	111.5	70-130	
Water	MS	Potassium (K)-Dissolved	WG1649304-6	L1284870-1	103	101	mg/L	102.7	70-130	
Water	MS	Selenium (Se)-Dissolved	WG1649304-6	L1284870-1	0.0437	0.0402	mg/L	108.7	70-130	
Water	MS	Silver (Ag)-Dissolved	WG1649304-6	L1284870-1	0.00415	0.00400	mg/L	103.7	70-130	
Water	MS	Sodium (Na)-Dissolved	WG1649304-6	L1284870-1	3.92	3.49	mg/L	121.6	70-130	
Water	MS	Strontium (Sr)-Dissolved	WG1649304-6	L1284870-1	0.130	0.130	mg/L	N/A	-	MS-B
Water	MS	Thallium (Tl)-Dissolved	WG1649304-6	L1284870-1	0.00407	0.00400	mg/L	101.9	70-130	
Water	MS	Tin (Sn)-Dissolved	WG1649304-6	L1284870-1	0.0205	0.0200	mg/L	102.4	70-130	
Water	MS	Titanium (Ti)-Dissolved	WG1649304-6	L1284870-1	0.0448	0.0400	mg/L	112.0	70-130	
Water	MS	Uranium (U)-Dissolved	WG1649304-6	L1284870-1	0.00462	0.00449	mg/L	103.3	70-130	
Water	MS	Vanadium (V)-Dissolved	WG1649304-6	L1284870-1	0.114	0.100	mg/L	114.4	70-130	
Water	MS	Zinc (Zn)-Dissolved	WG1649304-6	L1284870-1	0.437	0.401	mg/L	108.9	70-130	
Water	MS	Zirconium (Zr)-Dissolved	WG1649304-6	L1284870-1	0.0388	0.0400	mg/L	97.0	70-130	
Water	MS	Mercury (Hg)-Dissolved	WG1650578-7	Anonymous	0.00530	0.00500	ug/L	106.1	70-130	
Aggregate Organics										
Water	LCS	BOD	WG1648890-2		184	198	mg/L	92.9	85-115	
Water	LCS	BOD	WG1648890-5		187	198	mg/L	94.3	85-115	
Water	MB	BOD	WG1648890-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1648890-4		<2.0	<2	mg/L	-	2	

Project	PROJECT: AREMP
Report To	David Derosa, TECK METALS LTD.
ALS File No.	L1288829
Date Received	11-Apr-13 10:20
Date	23-Apr-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1288829-3	Water	WG1655731-9	Total Dissolved Solids	101	98	mg/L	2.8	20	-	-	-
L1288829-5	Water	WG1654209-12	Turbidity	0.95	0.97	NTU	2.2	15	-	-	-
Anions and Nutrients											
L1288829-1	Water	WG1655803-11	Ammonia, Total (as N)	<0.0050	0.0051	mg/L	N/A	20	-	-	RPD-NA
L1288829-3	Water	WG1655107-3	Total Kjeldahl Nitrogen	0.094	0.108	mg/L	14	20	-	-	-
Total Metals											
L1288829-5	Water	WG1655009-5	Mercury (Hg)-Total	<0.00078	<0.00078	ug/L	N/A	20	-	-	RPD-NA
Aggregate Organics											
L1288829-2	Water	WG1653938-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
Anions and Nutrients											
L1288829-6	Water	WG1656375-11	Alkalinity, Total (as CaCO3)	52.6	53.4	mg/L	1.5	20	-	-	-

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QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1654209-2	VA-TURB-SPK-8	8.21	8.00	NTU	102.6	85-115	
Water	CRM	Turbidity	WG1654209-5	VA-TURB-SPK-8	8.23	8.00	NTU	102.9	85-115	
Water	CRM	Turbidity	WG1654209-8	VA-TURB-SPK-8	8.07	8.00	NTU	100.9	85-115	
Water	CRM	Conductivity	WG1653822-17	VA-EC-PCT-CONTROL	144	147	uS/cm	98.2	90-110	
Water	CRM	Conductivity	WG1653822-18	VA-EC-PCT-CONTROL	143	147	uS/cm	97.1	90-110	
Water	CRM	Conductivity	WG1653822-19	VA-EC-PCT-CONTROL	143	147	uS/cm	97.4	90-110	
Water	CRM	Conductivity	WG1653822-20	VA-EC-PCT-CONTROL	145	147	uS/cm	98.8	90-110	
Water	CRM	Conductivity	WG1653822-21	VA-EC-PCT-CONTROL	145	147	uS/cm	98.7	90-110	
Water	CRM	Conductivity	WG1653822-22	VA-EC-PCT-CONTROL	145	147	uS/cm	98.4	90-110	
Water	CRM	Conductivity	WG1653822-23	VA-EC-PCT-CONTROL	147	147	uS/cm	99.7	90-110	
Water	CRM	pH	WG1653822-24	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1653822-25	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1653822-26	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1653822-27	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	pH	WG1653822-28	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	pH	WG1653822-29	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1653822-30	VA-PH7-BUF	7.04	7.00	pH	7.04	6.9-7.1	
Water	CRM	Turbidity	WG1654209-11	VA-TURB-SPK-8	8.10	8.00	NTU	101.3	85-115	
Water	CRM	Turbidity	WG1654209-14	VA-TURB-SPK-8	8.06	8.00	NTU	100.8	85-115	
Water	CRM	Turbidity	WG1654209-17	VA-TURB-SPK-8	8.14	8.00	NTU	101.8	85-115	
Water	CRM	Turbidity	WG1654209-20	VA-TURB-SPK-8	8.15	8.00	NTU	101.9	85-115	
Water	LCS	Total Dissolved Solids	WG1655731-2		415	425	mg/L	97.6	85-115	
Water	LCS	Total Dissolved Solids	WG1655731-5		439	425	mg/L	103.3	85-115	
Water	LCS	Total Dissolved Solids	WG1655731-8		431	425	mg/L	101.4	85-115	
Water	LCS	Total Suspended Solids	WG1656158-2		73.3	75.0	mg/L	97.7	85-115	
Water	LCS	Total Suspended Solids	WG1656158-5		69.3	75.0	mg/L	92.4	85-115	
Water	LCS	Total Suspended Solids	WG1656158-8		73.3	75.0	mg/L	97.7	85-115	
Water	LCS	Total Dissolved Solids	WG1655731-11		430	425	mg/L	101.1	85-115	
Water	LCS	Total Dissolved Solids	WG1655731-14		435	425	mg/L	102.3	85-115	
Water	LCS	Total Suspended Solids	WG1656158-11		71.3	75.0	mg/L	95.1	85-115	
Water	MB	Conductivity	WG1653822-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-7		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1653822-8		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1654209-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1654209-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1654209-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1655731-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1655731-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1655731-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1656158-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1656158-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1656158-7		<3.0	<3	mg/L	-	3	
Water	MB	Turbidity	WG1654209-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1654209-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1654209-16		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1654209-19		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1655731-10		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1655731-13		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1656158-10		<3.0	<3	mg/L	-	3	
Anions and Nutrients										
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-2	VA-ERA-PO4	4.24	3.99	mg/L	106.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-2	VA-ERA-PO4	4.17	3.99	mg/L	104.5	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-6	VA-ERA-PO4	4.27	3.99	mg/L	107.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-6	VA-ERA-PO4	4.27	3.99	mg/L	106.9	80-120	
Water	CRM	Ammonia, Total (as N)	WG1655803-2	VA-NH3-F	0.121	0.120	mg/L	100.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1655803-4	VA-NH3-F	0.115	0.120	mg/L	95.8	85-115	
Water	CRM	Ammonia, Total (as N)	WG1655803-6	VA-NH3-F	0.118	0.120	mg/L	98.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1655803-8	VA-NH3-F	0.117	0.120	mg/L	97.7	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1656375-2	VA-ALKL-CONTROL	15.4	15.0	mg/L	102.6	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1656375-5	VA-ALKM-CONTROL	72.2	75.0	mg/L	96.2	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1656375-8	VA-ALKH-CONTROL	245	250	mg/L	97.9	85-115	
Water	CRM	Ammonia, Total (as N)	WG1656462-2	VA-NH3-F	0.123	0.120	mg/L	102.2	85-115	
Water	CRM	Ammonia, Total (as N)	WG1656462-4	VA-NH3-F	0.116	0.120	mg/L	96.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1656462-6	VA-NH3-F	0.129	0.120	mg/L	107.6	85-115	
Water	CRM	Ammonia, Total (as N)	WG1656462-8	VA-NH3-F	0.129	0.120	mg/L	107.6	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-10	VA-ERA-PO4	4.33	3.99	mg/L	108.6	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-10	VA-ERA-PO4	4.34	3.99	mg/L	108.8	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-14	VA-ERA-PO4	4.29	3.99	mg/L	107.5	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-14	VA-ERA-PO4	4.32	3.99	mg/L	108.4	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-18	VA-ERA-PO4	4.33	3.99	mg/L	108.5	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-18	VA-ERA-PO4	4.16	3.99	mg/L	104.3	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-22	VA-ERA-PO4	4.31	3.99	mg/L	108.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-22	VA-ERA-PO4	4.25	3.99	mg/L	106.5	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-26	VA-ERA-PO4	4.39	3.99	mg/L	110.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-26	VA-ERA-PO4	4.35	3.99	mg/L	108.9	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1654437-30	VA-ERA-PO4	4.17	3.99	mg/L	104.4	80-120	
Water	CRM	Phosphorus (P)-Total	WG1654437-30	VA-ERA-PO4	4.35	3.99	mg/L	108.9	80-120	
Water	CRM	Ammonia, Total (as N)	WG1655803-10	VA-NH3-F	0.118	0.120	mg/L	98.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1656462-10	VA-NH3-F	0.127	0.120	mg/L	105.6	85-115	
Water	LCS	Bromide (Br)	WG1653882-2		0.537	0.500	mg/L	107.3	85-115	
Water	LCS	Chloride (Cl)	WG1653882-2		103	100	mg/L	103.0	85-115	
Water	LCS	Fluoride (F)	WG1653882-2		1.09	1.00	mg/L	109.2	85-115	
Water	LCS	Nitrate (as N)	WG1653882-2		2.69	2.50	mg/L	107.8	85-115	
Water	LCS	Nitrite (as N)	WG1653882-2		0.514	0.500	mg/L	102.7	85-115	
Water	LCS	Sulfate (SO4)	WG1653882-2		104	100	mg/L	103.6	85-115	

Water	LCS	Total Kjeldahl Nitrogen	WG1654274-2		1.05	1.00	mg/L	105.4	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1654274-5		1.09	1.00	mg/L	108.9	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1655107-2		1.11	1.00	mg/L	111.3	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1655107-5		1.05	1.00	mg/L	105.2	75-125	
Water	LCS	Bromide (Br)	WG1653882-15		0.503	0.500	mg/L	100.6	85-115	
Water	LCS	Chloride (Cl)	WG1653882-15		103	100	mg/L	103.1	85-115	
Water	LCS	Fluoride (F)	WG1653882-15		1.09	1.00	mg/L	109.4	85-115	
Water	LCS	Nitrate (as N)	WG1653882-15		2.70	2.50	mg/L	107.8	85-115	
Water	LCS	Nitrite (as N)	WG1653882-15		0.512	0.500	mg/L	102.4	85-115	
Water	LCS	Sulfate (SO4)	WG1653882-15		103	100	mg/L	103.4	85-115	

Water	MB	Bromide (Br)	WG1653882-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1653882-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1653882-1		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1653882-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1653882-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1653882-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1653882-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1653882-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1653882-4		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1653882-4		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Sulfate (SO4)	WG1653882-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1653882-7		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1653882-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1653882-7		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1653882-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1653882-7		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1653882-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Kjeldahl Nitrogen	WG1654274-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1654274-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-9		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Total Kjeldahl Nitrogen	WG1655107-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1655107-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Ammonia, Total (as N)	WG1655803-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1655803-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1655803-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1655803-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1655803-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Alkalinity, Total (as CaCO3)	WG1656375-1		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1656375-4		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1656375-7		<2.0	<2	mg/L	-	2	
Water	MB	Ammonia, Total (as N)	WG1656462-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1656462-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1656462-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1656462-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1656462-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Bromide (Br)	WG1653882-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1653882-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1653882-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1653882-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1653882-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1653882-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1653882-13		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1653882-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1653882-13		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1653882-13		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1653882-13		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1653882-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1654437-29		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1654437-29		<0.0020	<0.002	mg/L	-	0.002	

Water	MS	Bromide (Br)	WG1653882-5	Anonymous	0.501	0.500	mg/L	100.1	75-125	
Water	MS	Chloride (Cl)	WG1653882-5	Anonymous	100	100	mg/L	100.1	75-125	
Water	MS	Fluoride (F)	WG1653882-5	Anonymous	1.08	1.00	mg/L	108.4	75-125	
Water	MS	Nitrate (as N)	WG1653882-5	Anonymous	2.63	2.50	mg/L	105.1	75-125	
Water	MS	Nitrite (as N)	WG1653882-5	Anonymous	0.504	0.500	mg/L	100.9	75-125	
Water	MS	Sulfate (SO4)	WG1653882-5	Anonymous	101	100	mg/L	100.7	75-125	
Water	MS	Chloride (Cl)	WG1653882-8	Anonymous	110	110	mg/L	100.2	75-125	
Water	MS	Fluoride (F)	WG1653882-8	Anonymous	1.19	1.11	mg/L	107.9	75-125	
Water	MS	Nitrate (as N)	WG1653882-8	Anonymous	3.80	3.92	mg/L	95.4	75-125	
Water	MS	Nitrite (as N)	WG1653882-8	Anonymous	0.493	0.500	mg/L	98.7	75-125	
Water	MS	Sulfate (SO4)	WG1653882-8	Anonymous	120	122	mg/L	98.3	75-125	
Water	MS	Phosphorus (P)-Total Dissolved	WG1654437-4	Anonymous	0.209	0.208	mg/L	N/A	-	MS-B
Water	MS	Phosphorus (P)-Total	WG1654437-4	Anonymous	0.214	0.225	mg/L	N/A	-	MS-B
Water	MS	Phosphorus (P)-Total Dissolved	WG1654437-8	Anonymous	0.0510	0.0500	mg/L	102.0	70-130	
Water	MS	Phosphorus (P)-Total	WG1654437-8	Anonymous	0.0497	0.0526	mg/L	94.3	70-130	
Water	MS	Bromide (Br)	WG1653882-11	Anonymous	0.505	0.500	mg/L	101.0	75-125	
Water	MS	Chloride (Cl)	WG1653882-11	Anonymous	101	100	mg/L	100.5	75-125	
Water	MS	Fluoride (F)	WG1653882-11	Anonymous	1.10	1.00	mg/L	110.1	75-125	
Water	MS	Nitrate (as N)	WG1653882-11	Anonymous	2.63	2.50	mg/L	105.3	75-125	
Water	MS	Nitrite (as N)	WG1653882-11	Anonymous	0.493	0.500	mg/L	98.7	75-125	
Water	MS	Sulfate (SO4)	WG1653882-11	Anonymous	111	112	mg/L	98.8	75-125	
Water	MS	Bromide (Br)	WG1653882-14	Anonymous	0.518	0.500	mg/L	103.5	75-125	
Water	MS	Chloride (Cl)	WG1653882-14	Anonymous	101	100	mg/L	101.0	75-125	
Water	MS	Fluoride (F)	WG1653882-14	Anonymous	1.09	1.00	mg/L	109.0	75-125	
Water	MS	Nitrate (as N)	WG1653882-14	Anonymous	2.64	2.50	mg/L	105.7	75-125	
Water	MS	Nitrite (as N)	WG1653882-14	Anonymous	0.507	0.500	mg/L	101.3	75-125	
Water	MS	Sulfate (SO4)	WG1653882-14	Anonymous	101	100	mg/L	101.4	75-125	
Water	MS	Phosphorus (P)-Total	WG1654437-12	Anonymous	0.0508	0.0534	mg/L	94.6	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1654437-16	Anonymous	0.0819	0.0807	mg/L	102.3	70-130	
Water	MS	Phosphorus (P)-Total	WG1654437-16	Anonymous	0.142	0.129	mg/L	N/A	-	MS-B
Water	MS	Phosphorus (P)-Total	WG1654437-20	Anonymous	0.0556	0.0560	mg/L	99.1	70-130	

Water	MS	Phosphorus (P)-Total	WG1654437-24	Anonymous	0.0771	0.0749	mg/L	104.5	70-130
Water	MS	Phosphorus (P)-Total Dissolved	WG1654437-32	Anonymous	0.0511	0.0500	mg/L	102.1	70-130
Water	MS	Phosphorus (P)-Total	WG1654437-32	Anonymous	0.0902	0.0907	mg/L	99.1	70-130
Water	MS	Ammonia, Total (as N)	WG1655803-12	L1288829-1	0.190	0.200	mg/L	95.2	75-125
Water	MS	Ammonia, Total (as N)	WG1655803-14	Anonymous	0.206	0.216	mg/L	94.8	75-125
Water	MS	Ammonia, Total (as N)	WG1656462-12	Anonymous	0.197	0.200	mg/L	98.7	75-125
Water	MS	Ammonia, Total (as N)	WG1656462-14	Anonymous	0.255	0.252	mg/L	101.6	75-125

Organic / Inorganic Carbon

Water	LCS	Total Organic Carbon	WG1657487-2		8.54	8.57	mg/L	99.7	80-120
Water	LCS	Total Organic Carbon	WG1657487-4		8.22	8.57	mg/L	96.0	80-120
Water	LCS	Total Organic Carbon	WG1657487-6		8.23	8.57	mg/L	96.0	80-120
Water	LCS	Total Organic Carbon	WG1657487-8		8.09	8.57	mg/L	94.4	80-120
Water	LCS	Total Organic Carbon	WG1657487-17		8.49	8.57	mg/L	99.0	80-120
Water	MB	Total Organic Carbon	WG1657487-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1657487-3		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1657487-5		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1657487-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1657487-16		<0.50	<0.5	mg/L	-	0.5
Water	MS	Total Organic Carbon	WG1657487-11	Anonymous	5.86	6.13	mg/L	94.7	70-130
Water	MS	Total Organic Carbon	WG1657487-14	L1288829-6	6.19	6.61	mg/L	91.7	70-130

Total Metals

Water	LCS	Mercury (Hg)-Total	WG1655009-3	VA-HG-L-WATRM	0.00468	0.00500	ug/L	93.6	80-120
Water	LCS	Mercury (Hg)-Total	WG1655009-4	VA-HG-L-WATRM	0.00449	0.00500	ug/L	89.9	80-120
Water	LCS	Mercury (Hg)-Total	WG1656250-4	VA-HG-L-WATRM	0.00444	0.00500	ug/L	88.8	80-120
Water	LCS	Mercury (Hg)-Total	WG1656250-5	VA-HG-L-WATRM	0.00452	0.00500	ug/L	90.4	80-120
Water	MB	Mercury (Hg)-Total	WG1655009-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Total	WG1655009-2		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Total	WG1656250-1		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Total	WG1656250-2		<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Total	WG1656250-3		<0.00050	<0.0005	ug/L	-	0.0005
Water	MS	Mercury (Hg)-Total	WG1655009-7	L1288829-7	0.00513	0.00500	ug/L	102.5	70-130

Total Metals (Undigested)

Water	CRM	Aluminum (Al)-Total	WG1654039-2	VA-HIGH-WATRM	2.04	2.00	mg/L	101.8	80-120
Water	CRM	Antimony (Sb)-Total	WG1654039-2	VA-HIGH-WATRM	1.01	1.00	mg/L	101.1	80-120
Water	CRM	Arsenic (As)-Total	WG1654039-2	VA-HIGH-WATRM	1.01	1.00	mg/L	100.9	80-120
Water	CRM	Barium (Ba)-Total	WG1654039-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.4	80-120
Water	CRM	Beryllium (Be)-Total	WG1654039-2	VA-HIGH-WATRM	0.0955	0.100	mg/L	95.5	80-120
Water	CRM	Bismuth (Bi)-Total	WG1654039-2	VA-HIGH-WATRM	0.999	1.00	mg/L	99.9	80-120
Water	CRM	Boron (B)-Total	WG1654039-2	VA-HIGH-WATRM	0.87	1.00	mg/L	86.7	80-120
Water	CRM	Cadmium (Cd)-Total	WG1654039-2	VA-HIGH-WATRM	0.0991	0.100	mg/L	99.1	80-120
Water	CRM	Calcium (Ca)-Total	WG1654039-2	VA-HIGH-WATRM	51.7	50.0	mg/L	103.5	80-120
Water	CRM	Chromium (Cr)-Total	WG1654039-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.1	80-120
Water	CRM	Cobalt (Co)-Total	WG1654039-2	VA-HIGH-WATRM	0.250	0.250	mg/L	100.2	80-120
Water	CRM	Copper (Cu)-Total	WG1654039-2	VA-HIGH-WATRM	0.249	0.250	mg/L	99.8	80-120
Water	CRM	Iron (Fe)-Total	WG1654039-2	VA-HIGH-WATRM	0.954	1.00	mg/L	95.4	80-120
Water	CRM	Lead (Pb)-Total	WG1654039-2	VA-HIGH-WATRM	0.493	0.500	mg/L	98.6	80-120
Water	CRM	Lithium (Li)-Total	WG1654039-2	VA-HIGH-WATRM	0.235	0.250	mg/L	93.9	80-120
Water	CRM	Magnesium (Mg)-Total	WG1654039-2	VA-HIGH-WATRM	52.2	50.0	mg/L	104.3	80-120
Water	CRM	Manganese (Mn)-Total	WG1654039-2	VA-HIGH-WATRM	0.265	0.250	mg/L	105.9	80-120
Water	CRM	Molybdenum (Mo)-Total	WG1654039-2	VA-HIGH-WATRM	0.240	0.250	mg/L	96.1	80-120
Water	CRM	Nickel (Ni)-Total	WG1654039-2	VA-HIGH-WATRM	0.508	0.500	mg/L	101.6	80-120
Water	CRM	Phosphorus (P)-Total	WG1654039-2	VA-HIGH-WATRM	2.51	2.50	mg/L	100.6	80-120
Water	CRM	Potassium (K)-Total	WG1654039-2	VA-HIGH-WATRM	49.9	50.0	mg/L	99.9	80-120
Water	CRM	Selenium (Se)-Total	WG1654039-2	VA-HIGH-WATRM	0.970	1.00	mg/L	97.0	80-120
Water	CRM	Silicon (Si)-Total	WG1654039-2	VA-HIGH-WATRM	1.02	1.00	mg/L	101.5	80-120
Water	CRM	Silver (Ag)-Total	WG1654039-2	VA-HIGH-WATRM	0.0980	0.100	mg/L	98.0	80-120
Water	CRM	Sodium (Na)-Total	WG1654039-2	VA-HIGH-WATRM	51.9	50.0	mg/L	103.8	80-120
Water	CRM	Strontium (Sr)-Total	WG1654039-2	VA-HIGH-WATRM	0.239	0.250	mg/L	95.4	80-120
Water	CRM	Thallium (Tl)-Total	WG1654039-2	VA-HIGH-WATRM	0.993	1.00	mg/L	99.3	80-120
Water	CRM	Tin (Sn)-Total	WG1654039-2	VA-HIGH-WATRM	0.492	0.500	mg/L	98.4	80-120
Water	CRM	Titanium (Ti)-Total	WG1654039-2	VA-HIGH-WATRM	0.254	0.250	mg/L	101.4	80-120
Water	CRM	Uranium (U)-Total	WG1654039-2	VA-HIGH-WATRM	0.00496	0.00500	mg/L	99.2	80-120
Water	CRM	Vanadium (V)-Total	WG1654039-2	VA-HIGH-WATRM	0.494	0.500	mg/L	98.8	80-120
Water	CRM	Zinc (Zn)-Total	WG1654039-2	VA-HIGH-WATRM	0.509	0.500	mg/L	101.7	80-120
Water	CRM	Zirconium (Zr)-Total	WG1654039-2	VA-HIGH-WATRM	0.0918	0.100	mg/L	91.8	80-120
Water	MB	Aluminum (Al)-Total	WG1654039-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Total	WG1654039-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Total	WG1654039-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Total	WG1654039-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Total	WG1654039-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Total	WG1654039-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Total	WG1654039-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Total	WG1654039-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Total	WG1654039-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Total	WG1654039-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Total	WG1654039-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Total	WG1654039-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Total	WG1654039-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Total	WG1654039-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Total	WG1654039-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Total	WG1654039-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Total	WG1654039-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Total	WG1654039-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Total	WG1654039-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Total	WG1654039-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Total	WG1654039-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Total	WG1654039-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Total	WG1654039-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Total	WG1654039-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Total	WG1654039-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Total	WG1654039-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Total	WG1654039-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Total	WG1654039-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Total	WG1654039-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Total	WG1654039-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Total	WG1654039-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Total	WG1654039-1		<0.00050	<0.0005	mg/L	-	0.0005

Water	MB	Zirconium (Zr)-Total	WG1654039-1		<0.00010	<0.0001	mg/L	-	0.0001	

Dissolved Metals

Water	CRM	Aluminum (Al)-Dissolved	WG1654024-2	VA-HIGH-WATRM	2.04	2.00	mg/L	102.2	80-120	
Water	CRM	Antimony (Sb)-Dissolved	WG1654024-2	VA-HIGH-WATRM	1.03	1.00	mg/L	103.3	80-120	
Water	CRM	Arsenic (As)-Dissolved	WG1654024-2	VA-HIGH-WATRM	1.01	1.00	mg/L	100.9	80-120	
Water	CRM	Barium (Ba)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.249	0.250	mg/L	99.7	80-120	
Water	CRM	Beryllium (Be)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.0953	0.100	mg/L	95.3	80-120	
Water	CRM	Bismuth (Bi)-Dissolved	WG1654024-2	VA-HIGH-WATRM	1.02	1.00	mg/L	101.9	80-120	
Water	CRM	Boron (B)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.87	1.00	mg/L	87.3	80-120	
Water	CRM	Cadmium (Cd)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.0987	0.100	mg/L	98.7	80-120	
Water	CRM	Calcium (Ca)-Dissolved	WG1654024-2	VA-HIGH-WATRM	50.7	50.0	mg/L	101.4	80-120	
Water	CRM	Chromium (Cr)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.1	80-120	
Water	CRM	Cobalt (Co)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.247	0.250	mg/L	98.8	80-120	
Water	CRM	Copper (Cu)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.248	0.250	mg/L	99.3	80-120	
Water	CRM	Iron (Fe)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.974	1.00	mg/L	97.4	80-120	
Water	CRM	Lead (Pb)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.519	0.500	mg/L	103.8	80-120	
Water	CRM	Lithium (Li)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.236	0.250	mg/L	94.2	80-120	
Water	CRM	Magnesium (Mg)-Dissolved	WG1654024-2	VA-HIGH-WATRM	52.6	50.0	mg/L	105.1	80-120	
Water	CRM	Manganese (Mn)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.260	0.250	mg/L	104.2	80-120	
Water	CRM	Molybdenum (Mo)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.240	0.250	mg/L	96.0	80-120	
Water	CRM	Nickel (Ni)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.507	0.500	mg/L	101.4	80-120	
Water	CRM	Phosphorus (P)-Dissolved	WG1654024-2	VA-HIGH-WATRM	2.51	2.50	mg/L	100.5	80-120	
Water	CRM	Potassium (K)-Dissolved	WG1654024-2	VA-HIGH-WATRM	50.2	50.0	mg/L	100.5	80-120	
Water	CRM	Selenium (Se)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.986	1.00	mg/L	98.6	80-120	
Water	CRM	Silicon (Si)-Dissolved	WG1654024-2	VA-HIGH-WATRM	1.00	1.00	mg/L	100.2	80-120	
Water	CRM	Silver (Ag)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.0987	0.100	mg/L	98.7	80-120	
Water	CRM	Sodium (Na)-Dissolved	WG1654024-2	VA-HIGH-WATRM	50.4	50.0	mg/L	100.8	80-120	
Water	CRM	Strontium (Sr)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.234	0.250	mg/L	93.7	80-120	
Water	CRM	Thallium (Tl)-Dissolved	WG1654024-2	VA-HIGH-WATRM	1.02	1.00	mg/L	102.3	80-120	
Water	CRM	Tin (Sn)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.495	0.500	mg/L	99.0	80-120	
Water	CRM	Titanium (Ti)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.247	0.250	mg/L	98.7	80-120	
Water	CRM	Uranium (U)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.00502	0.00500	mg/L	100.5	80-120	
Water	CRM	Vanadium (V)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.1	80-120	
Water	CRM	Zinc (Zn)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.508	0.500	mg/L	101.5	80-120	
Water	CRM	Zirconium (Zr)-Dissolved	WG1654024-2	VA-HIGH-WATRM	0.0932	0.100	mg/L	93.2	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1655009-3	VA-HG-L-WATRM	0.00468	0.00500	ug/L	93.6	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1655009-4	VA-HG-L-WATRM	0.00449	0.00500	ug/L	89.9	80-120	
Water	MB	Aluminum (Al)-Dissolved	WG1654024-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Dissolved	WG1654024-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Dissolved	WG1654024-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Dissolved	WG1654024-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Dissolved	WG1654024-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Dissolved	WG1654024-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Dissolved	WG1654024-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Dissolved	WG1654024-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Dissolved	WG1654024-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Dissolved	WG1654024-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Dissolved	WG1654024-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Dissolved	WG1654024-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Dissolved	WG1654024-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Dissolved	WG1654024-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Dissolved	WG1654024-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Dissolved	WG1654024-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Dissolved	WG1654024-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Dissolved	WG1654024-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Dissolved	WG1654024-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Dissolved	WG1654024-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Dissolved	WG1654024-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Dissolved	WG1654024-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Dissolved	WG1654024-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Dissolved	WG1654024-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Dissolved	WG1654024-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Dissolved	WG1654024-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Dissolved	WG1654024-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Dissolved	WG1654024-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Dissolved	WG1654024-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Dissolved	WG1654024-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Dissolved	WG1654024-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Dissolved	WG1654024-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Dissolved	WG1654024-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Mercury (Hg)-Dissolved	WG1655009-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1655009-2		<0.00050	<0.0005	ug/L	-	0.0005	

Aggregate Organics

Water	LCS	BOD	WG1653938-2		135	198	mg/L	68.2	85-115	LCS-L
Water	LCS	BOD	WG1653938-5		134	198	mg/L	67.8	85-115	LCS-L
Water	MB	BOD	WG1653938-1		<2.0	<2	mg/L	-	2	
Water	MB	BOD	WG1653938-4		<2.0	<2	mg/L	-	2	

Apr18-	
Report To	David Derosa, TECK METALS LTD.
ALS File No.	L1291154
Date Received	18-Apr-13 10:00
Date	08-May-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1291154-13	Water	WG1657242-33	Conductivity	168	168	uS/cm	0.3	10	-	-	-
L1291154-35	Water	WG1657242-38	Conductivity	<2.0	<2.0	uS/cm	N/A	10	-	-	RPD-NA
L1291154-13	Water	WG1657242-33	pH	8.09	8.10	pH	-	-	0.01	0.3	J
L1291154-35	Water	WG1657242-38	pH	5.99	5.98	pH	-	-	0.01	0.3	J
L1291154-15	Water	WG1658343-3	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA
L1291154-3	Water	WG1657003-15	Total Dissolved Solids	86	83	mg/L	3.9	20	-	-	-
L1291154-14	Water	WG1658434-3	Total Dissolved Solids	81	81	mg/L	0.3	20	-	-	-
L1291154-25	Water	WG1657706-6	Total Dissolved Solids	72	74	mg/L	3.1	20	-	-	-
L1291154-16	Water	WG1657373-9	Turbidity	0.57	0.57	NTU	0.9	15	-	-	-
L1291154-32	Water	WG1657373-12	Turbidity	0.45	0.46	NTU	2.2	15	-	-	-
Anions and Nutrients											
L1291154-15	Water	WG1660231-14	Alkalinity, Total (as CaCO3)	58.4	59.4	mg/L	1.8	20	-	-	-
L1291154-17	Water	WG1659171-13	Ammonia, Total (as N)	<0.0050	0.0060	mg/L	N/A	20	-	-	RPD-NA
L1291154-30	Water	WG1659181-11	Ammonia, Total (as N)	0.0149	0.0147	mg/L	0.8	20	-	-	-
L1291154-18	Water	WG1656613-9	Bromide (Br)	<0.050	<0.050	mg/L	N/A	20	-	-	RPD-NA
L1291154-18	Water	WG1656613-9	Chloride (Cl)	0.94	0.94	mg/L	0.1	20	-	-	-
L1291154-18	Water	WG1656613-9	Fluoride (F)	0.073	0.073	mg/L	0.1	20	-	-	-
L1291154-18	Water	WG1656613-9	Nitrate (as N)	0.152	0.152	mg/L	0.4	20	-	-	-
L1291154-18	Water	WG1656613-9	Nitrite (as N)	<0.0010	<0.0010	mg/L	N/A	20	-	-	RPD-NA
L1291154-18	Water	WG1658607-6	Total Kjeldahl Nitrogen	0.080	0.091	mg/L	12	20	-	-	-
L1291154-29	Water	WG1659147-4	Total Kjeldahl Nitrogen	0.064	0.083	mg/L	-	-	0.019	0.1	J
L1291154-8	Water	WG1657374-15	Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1291154-21	Water	WG1657374-19	Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1291154-8	Water	WG1657374-15	Phosphorus (P)-Total	0.0037	0.0031	mg/L	15	20	-	-	-
L1291154-21	Water	WG1657374-19	Phosphorus (P)-Total	0.0039	0.0037	mg/L	4.4	20	-	-	-
L1291154-18	Water	WG1656613-9	Sulfate (SO4)	12.0	12.0	mg/L	0.3	20	-	-	-
Organic / Inorganic Carbon											
L1291154-7	Water	WG1660061-2	Total Organic Carbon	1.91	1.74	mg/L	8.8	20	-	-	-
L1291154-28	Water	WG1660061-6	Total Organic Carbon	0.93	0.92	mg/L	1.2	20	-	-	-
Total Metals											
L1291154-19	Water	WG1660067-5	Mercury (Hg)-Total	<0.0023	<0.0023	ug/L	N/A	20	-	-	RPD-NA
L1291154-34	Water	WG1660067-7	Mercury (Hg)-Total	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
Dissolved Metals											
L1291154-18	Water	WG1658596-5	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
L1291154-32	Water	WG1660067-9	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
Aggregate Organics											
L1291154-1	Water	WG1657072-3	BOD	6.4	6.6	mg/L	3.7	20	-	-	-
L1291154-27	Water	WG1657298-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA
Physical Tests											
L1291154-35	Water	WG1658343-6	Total Suspended Solids	<3.0	<3.0	mg/L	N/A	20	-	-	RPD-NA

Project	
Report To	David Derosa, TECK METALS LTD.
ALS File No.	L1291154
Date Received	18-Apr-13 10:00
Date	08-May-13

QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1657373-2	VA-TURB-SPK-8	8.29	8.00	NTU	103.6	85-115	
Water	CRM	Turbidity	WG1657373-5	VA-TURB-SPK-8	8.24	8.00	NTU	103.0	85-115	
Water	CRM	Turbidity	WG1657373-8	VA-TURB-SPK-8	8.23	8.00	NTU	102.9	85-115	
Water	CRM	Conductivity	WG1657242-17	VA-EC-PCT-CONTROL	145	147	uS/cm	98.5	90-110	
Water	CRM	Conductivity	WG1657242-18	VA-EC-PCT-CONTROL	143	147	uS/cm	97.2	90-110	
Water	CRM	Conductivity	WG1657242-19	VA-EC-PCT-CONTROL	144	147	uS/cm	97.9	90-110	
Water	CRM	Conductivity	WG1657242-20	VA-EC-PCT-CONTROL	144	147	uS/cm	98.0	90-110	
Water	CRM	Conductivity	WG1657242-21	VA-EC-PCT-CONTROL	143	147	uS/cm	97.3	90-110	
Water	CRM	Conductivity	WG1657242-22	VA-EC-PCT-CONTROL	144	147	uS/cm	98.0	90-110	
Water	CRM	Conductivity	WG1657242-23	VA-EC-PCT-CONTROL	146	147	uS/cm	99.0	90-110	
Water	CRM	pH	WG1657242-24	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1657242-25	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	pH	WG1657242-26	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1657242-27	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1657242-28	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1657242-29	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1657242-30	VA-PH7-BUF	7.03	7.00	pH	7.03	6.9-7.1	
Water	CRM	Turbidity	WG1657373-11	VA-TURB-SPK-8	8.15	8.00	NTU	101.9	85-115	
Water	CRM	Turbidity	WG1657373-14	VA-TURB-SPK-8	8.35	8.00	NTU	104.4	85-115	
Water	CRM	Turbidity	WG1657373-17	VA-TURB-SPK-8	8.24	8.00	NTU	103.0	85-115	
Water	CRM	Turbidity	WG1657373-20	VA-TURB-SPK-8	8.52	8.00	NTU	106.5	85-115	
Water	LCS	Total Dissolved Solids	WG1657003-2		422	425	mg/L	99.2	85-115	
Water	LCS	Total Dissolved Solids	WG1657003-5		426	425	mg/L	100.2	85-115	
Water	LCS	Total Dissolved Solids	WG1657003-8		429	425	mg/L	100.9	85-115	
Water	LCS	Total Dissolved Solids	WG1657706-5		387	425	mg/L	91.0	85-115	
Water	LCS	Total Dissolved Solids	WG1657706-8		407	425	mg/L	95.8	85-115	
Water	LCS	Total Suspended Solids	WG1658343-2		71.4	75.0	mg/L	95.2	85-115	
Water	LCS	Total Suspended Solids	WG1658343-5		76.4	75.0	mg/L	101.9	85-115	
Water	LCS	Total Suspended Solids	WG1658343-8		79.4	75.0	mg/L	105.9	85-115	
Water	LCS	Total Dissolved Solids	WG1658434-2		423	425	mg/L	99.5	85-115	
Water	LCS	Total Dissolved Solids	WG1658434-5		432	425	mg/L	101.7	85-115	
Water	LCS	Total Dissolved Solids	WG1657003-11		428	425	mg/L	100.8	85-115	
Water	LCS	Total Dissolved Solids	WG1657003-14		433	425	mg/L	101.8	85-115	
Water	LCS	Total Dissolved Solids	WG1657706-11		418	425	mg/L	98.2	85-115	
Water	LCS	Total Dissolved Solids	WG1657706-14		390	425	mg/L	91.7	85-115	
Water	LCS	Total Suspended Solids	WG1658343-11		85.4	75.0	mg/L	113.9	85-115	
Water	LCS	Total Suspended Solids	WG1658343-14		85.4	75.0	mg/L	113.9	85-115	
Water	LCS	Total Suspended Solids	WG1658343-17		82.4	75.0	mg/L	109.9	85-115	
Water	MB	Total Dissolved Solids	WG1657003-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657003-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657003-7		<10	<10	mg/L	-	10	
Water	MB	Conductivity	WG1657242-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-7		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1657242-8		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1657373-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1657373-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1657373-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1657706-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657706-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657706-7		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1658343-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1658343-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1658343-7		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1658434-1		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1658434-4		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657003-10		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657003-13		<10	<10	mg/L	-	10	
Water	MB	Turbidity	WG1657373-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1657373-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1657373-16		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1657373-19		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Dissolved Solids	WG1657706-10		<10	<10	mg/L	-	10	
Water	MB	Total Dissolved Solids	WG1657706-13		<10	<10	mg/L	-	10	
Water	MB	Total Suspended Solids	WG1658343-10		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1658343-13		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1658343-16		<3.0	<3	mg/L	-	3	
Anions and Nutrients										
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-2	VA-ERA-PO4	4.14	3.99	mg/L	103.7	80-120	
Water	CRM	Phosphorus (P)-Total	WG1657374-2	VA-ERA-PO4	4.11	3.99	mg/L	102.9	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-6	VA-ERA-PO4	4.31	3.99	mg/L	108.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1657374-6	VA-ERA-PO4	4.29	3.99	mg/L	107.6	80-120	
Water	CRM	Ammonia, Total (as N)	WG1659171-2	VA-NH3-F	0.119	0.120	mg/L	98.9	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659171-4	VA-NH3-F	0.112	0.120	mg/L	93.6	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659171-6	VA-NH3-F	0.113	0.120	mg/L	94.3	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659171-8	VA-NH3-F	0.116	0.120	mg/L	96.7	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659181-2	VA-NH3-F	0.126	0.120	mg/L	105.3	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659181-4	VA-NH3-F	0.107	0.120	mg/L	89.3	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659181-6	VA-NH3-F	0.108	0.120	mg/L	90.3	85-115	
Water	CRM	Ammonia, Total (as N)	WG1659181-8	VA-NH3-F	0.118	0.120	mg/L	98.4	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1660231-2	VA-ALKL-CONTROL	15.5	15.0	mg/L	103.5	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1660231-5	VA-ALKM-CONTROL	78.2	75.0	mg/L	104.2	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1660231-8	VA-ALKH-CONTROL	251	250	mg/L	100.3	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-10	VA-ERA-PO4	4.13	3.99	mg/L	103.4	80-120	
Water	CRM	Phosphorus (P)-Total	WG1657374-10	VA-ERA-PO4	4.10	3.99	mg/L	102.8	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-14	VA-ERA-PO4	4.15	3.99	mg/L	104.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1657374-14	VA-ERA-PO4	4.13	3.99	mg/L	103.6	80-120	

Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-18	VA-ERA-PO4	4.19	3.99	mg/L	104.9	80-120
Water	CRM	Phosphorus (P)-Total	WG1657374-18	VA-ERA-PO4	4.20	3.99	mg/L	105.2	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-22	VA-ERA-PO4	4.10	3.99	mg/L	102.7	80-120
Water	CRM	Phosphorus (P)-Total	WG1657374-22	VA-ERA-PO4	3.99	3.99	mg/L	99.9	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-26	VA-ERA-PO4	4.06	3.99	mg/L	101.8	80-120
Water	CRM	Phosphorus (P)-Total	WG1657374-26	VA-ERA-PO4	4.06	3.99	mg/L	101.8	80-120
Water	CRM	Phosphorus (P)-Total Dissolved	WG1657374-30	VA-ERA-PO4	4.13	3.99	mg/L	103.6	80-120
Water	CRM	Phosphorus (P)-Total	WG1657374-30	VA-ERA-PO4	4.07	3.99	mg/L	102.0	80-120
Water	CRM	Ammonia, Total (as N)	WG1659171-10	VA-NH3-F	0.112	0.120	mg/L	93.6	85-115
Water	CRM	Ammonia, Total (as N)	WG1659181-10	VA-NH3-F	0.111	0.120	mg/L	92.3	85-115
Water	LCS	Bromide (Br)	WG1656613-2		0.534	0.500	mg/L	106.8	85-115
Water	LCS	Chloride (Cl)	WG1656613-2		102	100	mg/L	102.4	85-115
Water	LCS	Fluoride (F)	WG1656613-2		1.08	1.00	mg/L	108.4	85-115
Water	LCS	Nitrate (as N)	WG1656613-2		2.70	2.50	mg/L	107.9	85-115
Water	LCS	Nitrite (as N)	WG1656613-2		0.514	0.500	mg/L	102.9	85-115
Water	LCS	Sulfate (SO4)	WG1656613-2		103	100	mg/L	102.8	85-115
Water	LCS	Total Kjeldahl Nitrogen	WG1658607-2		1.04	1.00	mg/L	103.8	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1658607-5		1.06	1.00	mg/L	105.8	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1659147-2		1.20	1.00	mg/L	120.4	75-125
Water	LCS	Total Kjeldahl Nitrogen	WG1659147-6		1.11	1.00	mg/L	111.1	75-125
Water	LCS	Bromide (Br)	WG1665512-2		0.449	0.500	mg/L	89.8	85-115
Water	LCS	Chloride (Cl)	WG1665512-2		101	100	mg/L	101.0	85-115
Water	LCS	Fluoride (F)	WG1665512-2		1.08	1.00	mg/L	107.9	85-115
Water	LCS	Nitrate (as N)	WG1665512-2		2.54	2.50	mg/L	101.7	85-115
Water	LCS	Nitrite (as N)	WG1665512-2		0.499	0.500	mg/L	99.7	85-115
Water	LCS	Sulfate (SO4)	WG1665512-2		101	100	mg/L	100.8	85-115
Water	LCS	Bromide (Br)	WG1656613-15		0.528	0.500	mg/L	105.5	85-115
Water	LCS	Chloride (Cl)	WG1656613-15		103	100	mg/L	102.6	85-115
Water	LCS	Fluoride (F)	WG1656613-15		1.09	1.00	mg/L	108.6	85-115
Water	LCS	Nitrate (as N)	WG1656613-15		2.70	2.50	mg/L	108.2	85-115
Water	LCS	Nitrite (as N)	WG1656613-15		0.517	0.500	mg/L	103.3	85-115
Water	LCS	Sulfate (SO4)	WG1656613-15		103	100	mg/L	103.0	85-115
Water	LCS	Bromide (Br)	WG1665512-15		0.452	0.500	mg/L	90.3	85-115
Water	LCS	Chloride (Cl)	WG1665512-15		102	100	mg/L	102.1	85-115
Water	LCS	Fluoride (F)	WG1665512-15		1.07	1.00	mg/L	107.5	85-115
Water	LCS	Nitrate (as N)	WG1665512-15		2.57	2.50	mg/L	102.8	85-115
Water	LCS	Nitrite (as N)	WG1665512-15		0.511	0.500	mg/L	102.2	85-115
Water	LCS	Sulfate (SO4)	WG1665512-15		102	100	mg/L	101.9	85-115
Water	MB	Bromide (Br)	WG1656613-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1656613-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1656613-1		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1656613-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1656613-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1656613-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1656613-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1656613-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1656613-4		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1656613-4		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1656613-4		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1656613-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1656613-7		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1656613-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1656613-7		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1656613-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1656613-7		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1656613-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-1		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1657374-1		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-5		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1657374-5		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-9		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Phosphorus (P)-Total	WG1657374-9		<0.0020	<0.002	mg/L	-	0.002
Water	MB	Total Kjeldahl Nitrogen	WG1658607-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1658607-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1659147-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Total Kjeldahl Nitrogen	WG1659147-5		<0.050	<0.05	mg/L	-	0.05
Water	MB	Ammonia, Total (as N)	WG1659171-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659171-3		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659171-5		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659171-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659171-9		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659181-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659181-3		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659181-5		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659181-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Ammonia, Total (as N)	WG1659181-9		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Alkalinity, Total (as CaCO3)	WG1660231-1		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1660231-4		<2.0	<2	mg/L	-	2
Water	MB	Alkalinity, Total (as CaCO3)	WG1660231-7		<2.0	<2	mg/L	-	2
Water	MB	Bromide (Br)	WG1665512-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1665512-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1665512-1		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1665512-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1665512-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1665512-1		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1665512-4		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1665512-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1665512-4		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1665512-4		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1665512-4		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1665512-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1665512-7		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1665512-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1665512-7		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1665512-7		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1665512-7		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1665512-7		<0.50	<0.5	mg/L	-	0.5
Water	MB	Bromide (Br)	WG1656613-10		<0.050	<0.05	mg/L	-	0.05
Water	MB	Chloride (Cl)	WG1656613-10		<0.50	<0.5	mg/L	-	0.5
Water	MB	Fluoride (F)	WG1656613-10		<0.020	<0.02	mg/L	-	0.02
Water	MB	Nitrate (as N)	WG1656613-10		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Nitrite (as N)	WG1656613-10		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Sulfate (SO4)	WG1656613-10		<0.50	<0.5	mg/L	-	0.5

Water	MB	Bromide (Br)	WG1656613-13		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1656613-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1656613-13		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1656613-13		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1656613-13		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1656613-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1657374-13		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1657374-17		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1657374-21		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1657374-25		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1657374-29		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1657374-29		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Bromide (Br)	WG1665512-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1665512-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1665512-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1665512-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1665512-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1665512-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1665512-13		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1665512-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1665512-13		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1665512-13		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1665512-13		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1665512-13		<0.50	<0.5	mg/L	-	0.5	

Water	MS	Chloride (Cl)	WG1656613-5	Anonymous	100	100	mg/L	100.4	75-125	
Water	MS	Fluoride (F)	WG1656613-5	Anonymous	1.24	1.20	mg/L	104.8	75-125	
Water	MS	Nitrate (as N)	WG1656613-5	Anonymous	2.64	2.50	mg/L	105.8	75-125	
Water	MS	Nitrite (as N)	WG1656613-5	Anonymous	0.488	0.500	mg/L	97.5	75-125	
Water	MS	Sulfate (SO4)	WG1656613-5	Anonymous	106	108	mg/L	98.6	75-125	
Water	MS	Chloride (Cl)	WG1656613-8	Anonymous	101	102	mg/L	99.7	75-125	
Water	MS	Fluoride (F)	WG1656613-8	Anonymous	1.10	1.03	mg/L	106.5	75-125	
Water	MS	Nitrate (as N)	WG1656613-8	Anonymous	3.51	3.58	mg/L	97.4	75-125	
Water	MS	Nitrite (as N)	WG1656613-8	Anonymous	0.493	0.500	mg/L	98.6	75-125	
Water	MS	Sulfate (SO4)	WG1656613-8	Anonymous	106	107	mg/L	99.0	75-125	
Water	MS	Phosphorus (P)-Total	WG1657374-4	Anonymous	0.0564	0.0591	mg/L	94.5	70-130	
Water	MS	Phosphorus (P)-Total	WG1657374-8	Anonymous	0.0568	0.0579	mg/L	97.8	70-130	
Water	MS	Bromide (Br)	WG1665512-5	Anonymous	0.435	0.500	mg/L	87.1	75-125	
Water	MS	Chloride (Cl)	WG1665512-5	Anonymous	101	100	mg/L	100.5	75-125	
Water	MS	Fluoride (F)	WG1665512-5	Anonymous	1.23	1.16	mg/L	106.9	75-125	
Water	MS	Nitrate (as N)	WG1665512-5	Anonymous	2.54	2.51	mg/L	101.1	75-125	
Water	MS	Nitrite (as N)	WG1665512-5	Anonymous	0.494	0.500	mg/L	98.7	75-125	
Water	MS	Sulfate (SO4)	WG1665512-5	Anonymous	126	130	mg/L	96.6	75-125	
Water	MS	Bromide (Br)	WG1665512-8	Anonymous	0.439	0.500	mg/L	87.9	75-125	
Water	MS	Fluoride (F)	WG1665512-8	Anonymous	1.08	1.00	mg/L	108.3	75-125	
Water	MS	Nitrate (as N)	WG1665512-8	Anonymous	2.53	2.50	mg/L	101.1	75-125	
Water	MS	Nitrite (as N)	WG1665512-8	Anonymous	0.497	0.500	mg/L	99.4	75-125	
Water	MS	Sulfate (SO4)	WG1665512-8	Anonymous	100	100	mg/L	100.2	75-125	
Water	MS	Bromide (Br)	WG1656613-11	L1291154-5	0.517	0.500	mg/L	103.3	75-125	
Water	MS	Chloride (Cl)	WG1656613-11	L1291154-5	101	101	mg/L	100.5	75-125	
Water	MS	Fluoride (F)	WG1656613-11	L1291154-5	1.15	1.07	mg/L	107.8	75-125	
Water	MS	Nitrate (as N)	WG1656613-11	L1291154-5	2.78	2.64	mg/L	105.3	75-125	
Water	MS	Nitrite (as N)	WG1656613-11	L1291154-5	0.495	0.500	mg/L	98.9	75-125	
Water	MS	Sulfate (SO4)	WG1656613-11	L1291154-5	110	111	mg/L	99.0	75-125	
Water	MS	Bromide (Br)	WG1656613-14	Anonymous	0.485	0.500	mg/L	96.9	75-125	
Water	MS	Chloride (Cl)	WG1656613-14	Anonymous	103	102	mg/L	100.9	75-125	
Water	MS	Fluoride (F)	WG1656613-14	Anonymous	1.16	1.10	mg/L	106.0	75-125	
Water	MS	Nitrate (as N)	WG1656613-14	Anonymous	4.18	4.37	mg/L	92.5	75-125	
Water	MS	Nitrite (as N)	WG1656613-14	Anonymous	0.492	0.513	mg/L	95.8	75-125	
Water	MS	Sulfate (SO4)	WG1656613-14	Anonymous	219	234	mg/L	N/A	-	MS-B
Water	MS	Phosphorus (P)-Total Dissolved	WG1657374-16	L1291154-9	0.0488	0.0500	mg/L	97.6	70-130	
Water	MS	Phosphorus (P)-Total	WG1657374-16	L1291154-9	0.0513	0.0537	mg/L	95.3	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1657374-20	L1291154-22	0.0495	0.0500	mg/L	99.1	70-130	
Water	MS	Phosphorus (P)-Total	WG1657374-20	L1291154-22	0.0524	0.0535	mg/L	97.9	70-130	
Water	MS	Phosphorus (P)-Total Dissolved	WG1657374-24	Anonymous	0.0497	0.0500	mg/L	99.3	70-130	
Water	MS	Phosphorus (P)-Total	WG1657374-24	Anonymous	0.0510	0.0500	mg/L	102.0	70-130	
Water	MS	Phosphorus (P)-Total	WG1657374-32	Anonymous	0.0553	0.0581	mg/L	94.4	70-130	
Water	MS	Ammonia, Total (as N)	WG1659171-12	Anonymous	0.216	0.200	mg/L	108.1	75-125	
Water	MS	Ammonia, Total (as N)	WG1659171-14	L1291154-17	0.217	0.200	mg/L	108.3	75-125	
Water	MS	Ammonia, Total (as N)	WG1659181-12	L1291154-30	0.194	0.215	mg/L	89.7	75-125	
Water	MS	Ammonia, Total (as N)	WG1659181-14	Anonymous	0.215	0.221	mg/L	97.2	75-125	
Water	MS	Bromide (Br)	WG1665512-11	Anonymous	0.440	0.500	mg/L	87.9	75-125	
Water	MS	Chloride (Cl)	WG1665512-11	Anonymous	101	100	mg/L	101.1	75-125	
Water	MS	Fluoride (F)	WG1665512-11	Anonymous	1.10	1.00	mg/L	109.6	75-125	
Water	MS	Nitrate (as N)	WG1665512-11	Anonymous	2.54	2.50	mg/L	101.8	75-125	
Water	MS	Nitrite (as N)	WG1665512-11	Anonymous	0.497	0.500	mg/L	99.5	75-125	
Water	MS	Sulfate (SO4)	WG1665512-11	Anonymous	101	100	mg/L	100.9	75-125	
Water	MS	Bromide (Br)	WG1665512-14	Anonymous	0.470	0.500	mg/L	94.0	75-125	
Water	MS	Chloride (Cl)	WG1665512-14	Anonymous	112	112	mg/L	99.9	75-125	
Water	MS	Fluoride (F)	WG1665512-14	Anonymous	1.31	1.25	mg/L	106.1	75-125	
Water	MS	Nitrate (as N)	WG1665512-14	Anonymous	3.00	3.02	mg/L	99.5	75-125	
Water	MS	Nitrite (as N)	WG1665512-14	Anonymous	0.486	0.513	mg/L	94.6	75-125	
Water	MS	Sulfate (SO4)	WG1665512-14	Anonymous	136	141	mg/L	95.4	75-125	

Organic / Inorganic Carbon

Water	LCS	Total Organic Carbon	WG1660061-1		8.84	8.57	mg/L	103.1	80-120
Water	LCS	Total Organic Carbon	WG1660061-5		8.56	8.57	mg/L	99.9	80-120
Water	LCS	Total Organic Carbon	WG1660061-9		8.26	8.57	mg/L	96.4	80-120
Water	LCS	Total Organic Carbon	WG1660938-1		8.65	8.57	mg/L	100.9	80-120
Water	LCS	Total Organic Carbon	WG1660938-3		8.58	8.57	mg/L	100.1	80-120
Water	LCS	Total Organic Carbon	WG1660938-5		8.57	8.57	mg/L	99.98	80-120
Water	LCS	Total Organic Carbon	WG1660938-7		8.69	8.57	mg/L	101.4	80-120
Water	LCS	Total Organic Carbon	WG1661892-1		8.55	8.57	mg/L	99.8	80-120
Water	LCS	Total Organic Carbon	WG1661892-4		8.55	8.57	mg/L	99.8	80-120
Water	LCS	Total Organic Carbon	WG1660061-12		8.09	8.57	mg/L	94.4	80-120
Water	LCS	Total Organic Carbon	WG1660061-15		8.14	8.57	mg/L	95.0	80-120
Water	LCS	Total Organic Carbon	WG1660061-18		8.41	8.57	mg/L	98.1	80-120

Water	MB	Total Organic Carbon	WG1660061-4		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1660061-8		<0.50	<0.5	mg/L	-	0.5
Water	MB	Total Organic Carbon	WG1660938-2		<0.50	<0.5	mg/L	-	0.5

Water	MB	Total Organic Carbon	WG1660938-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1660938-6		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1661892-3		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1660061-11		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1660061-14		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1660061-17		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Total Organic Carbon	WG1660061-3	L1291154-18	6.96	6.72	mg/L	104.9	70-130	
Water	MS	Total Organic Carbon	WG1660061-7	Anonymous	24.7	18.5	mg/L	N/A	-	MS-B
Water	MS	Total Organic Carbon	WG1660938-11	Anonymous	8.19	7.96	mg/L	104.6	70-130	
Total Metals										
Water	LCS	Mercury (Hg)-Total	WG1660067-2	VA-HG-L-WATRM	0.00500	0.00500	ug/L	100.1	80-120	
Water	LCS	Mercury (Hg)-Total	WG1660820-2	VA-HG-L-WATRM	0.00511	0.00500	ug/L	102.1	80-120	
Water	MB	Mercury (Hg)-Total	WG1660067-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1660067-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1660067-4		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1660820-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1660820-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Total	WG1660067-6	L1291154-19	0.00760	0.00729	ug/L	106.2	70-130	
Water	MS	Mercury (Hg)-Total	WG1660067-8	L1291154-34	0.00523	0.00500	ug/L	104.6	70-130	
Water	MS	Mercury (Hg)-Total	WG1660820-4	Anonymous	0.528	0.005	ug/L	10570	70-130	MS-B
Total Metals (Undigested)										
Water	CRM	Aluminum (Al)-Total	WG1657184-2	VA-HIGH-WATRM	2.01	2.00	mg/L	100.3	80-120	
Water	CRM	Antimony (Sb)-Total	WG1657184-2	VA-HIGH-WATRM	1.03	1.00	mg/L	102.7	80-120	
Water	CRM	Arsenic (As)-Total	WG1657184-2	VA-HIGH-WATRM	1.01	1.00	mg/L	100.5	80-120	
Water	CRM	Barium (Ba)-Total	WG1657184-2	VA-HIGH-WATRM	0.249	0.250	mg/L	99.7	80-120	
Water	CRM	Beryllium (Be)-Total	WG1657184-2	VA-HIGH-WATRM	0.0990	0.100	mg/L	99.0	80-120	
Water	CRM	Bismuth (Bi)-Total	WG1657184-2	VA-HIGH-WATRM	0.983	1.00	mg/L	98.3	80-120	
Water	CRM	Boron (B)-Total	WG1657184-2	VA-HIGH-WATRM	0.89	1.00	mg/L	88.6	80-120	
Water	CRM	Cadmium (Cd)-Total	WG1657184-2	VA-HIGH-WATRM	0.101	0.100	mg/L	100.6	80-120	
Water	CRM	Calcium (Ca)-Total	WG1657184-2	VA-HIGH-WATRM	50.0	50.0	mg/L	100.1	80-120	
Water	CRM	Chromium (Cr)-Total	WG1657184-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.3	80-120	
Water	CRM	Cobalt (Co)-Total	WG1657184-2	VA-HIGH-WATRM	0.247	0.250	mg/L	99.0	80-120	
Water	CRM	Copper (Cu)-Total	WG1657184-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.2	80-120	
Water	CRM	Iron (Fe)-Total	WG1657184-2	VA-HIGH-WATRM	0.986	1.00	mg/L	98.6	80-120	
Water	CRM	Lead (Pb)-Total	WG1657184-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.2	80-120	
Water	CRM	Lithium (Li)-Total	WG1657184-2	VA-HIGH-WATRM	0.252	0.250	mg/L	101.0	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1657184-2	VA-HIGH-WATRM	50.3	50.0	mg/L	100.6	80-120	
Water	CRM	Manganese (Mn)-Total	WG1657184-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.4	80-120	
Water	CRM	Molybdenum (Mo)-Total	WG1657184-2	VA-HIGH-WATRM	0.250	0.250	mg/L	99.9	80-120	
Water	CRM	Nickel (Ni)-Total	WG1657184-2	VA-HIGH-WATRM	0.493	0.500	mg/L	98.6	80-120	
Water	CRM	Phosphorus (P)-Total	WG1657184-2	VA-HIGH-WATRM	2.43	2.50	mg/L	97.2	80-120	
Water	CRM	Potassium (K)-Total	WG1657184-2	VA-HIGH-WATRM	50.6	50.0	mg/L	101.3	80-120	
Water	CRM	Selenium (Se)-Total	WG1657184-2	VA-HIGH-WATRM	0.983	1.00	mg/L	98.3	80-120	
Water	CRM	Silicon (Si)-Total	WG1657184-2	VA-HIGH-WATRM	0.989	1.00	mg/L	98.9	80-120	
Water	CRM	Silver (Ag)-Total	WG1657184-2	VA-HIGH-WATRM	0.102	0.100	mg/L	102.4	80-120	
Water	CRM	Sodium (Na)-Total	WG1657184-2	VA-HIGH-WATRM	50.4	50.0	mg/L	100.9	80-120	
Water	CRM	Strontium (Sr)-Total	WG1657184-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.1	80-120	
Water	CRM	Thallium (Tl)-Total	WG1657184-2	VA-HIGH-WATRM	1.00	1.00	mg/L	100.0	80-120	
Water	CRM	Tin (Sn)-Total	WG1657184-2	VA-HIGH-WATRM	0.497	0.500	mg/L	99.3	80-120	
Water	CRM	Titanium (Ti)-Total	WG1657184-2	VA-HIGH-WATRM	0.250	0.250	mg/L	99.9	80-120	
Water	CRM	Uranium (U)-Total	WG1657184-2	VA-HIGH-WATRM	0.00504	0.00500	mg/L	100.8	80-120	
Water	CRM	Vanadium (V)-Total	WG1657184-2	VA-HIGH-WATRM	0.506	0.500	mg/L	101.3	80-120	
Water	CRM	Zinc (Zn)-Total	WG1657184-2	VA-HIGH-WATRM	0.489	0.500	mg/L	97.8	80-120	
Water	CRM	Zirconium (Zr)-Total	WG1657184-2	VA-HIGH-WATRM	0.0989	0.100	mg/L	98.9	80-120	
Water	MB	Aluminum (Al)-Total	WG1657184-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Total	WG1657184-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Total	WG1657184-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Total	WG1657184-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Total	WG1657184-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Total	WG1657184-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Total	WG1657184-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Total	WG1657184-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Total	WG1657184-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Total	WG1657184-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Total	WG1657184-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Total	WG1657184-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Total	WG1657184-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Total	WG1657184-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Total	WG1657184-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Total	WG1657184-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Total	WG1657184-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Total	WG1657184-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Total	WG1657184-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Total	WG1657184-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Total	WG1657184-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Total	WG1657184-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Total	WG1657184-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Total	WG1657184-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Total	WG1657184-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Total	WG1657184-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Total	WG1657184-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Total	WG1657184-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Total	WG1657184-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Total	WG1657184-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Total	WG1657184-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Total	WG1657184-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Total	WG1657184-1		<0.00010	<0.0001	mg/L	-	0.0001	
Dissolved Metals										
Water	CRM	Aluminum (Al)-Dissolved	WG1657185-2	VA-HIGH-WATRM	1.96	2.00	mg/L	98.1	80-120	
Water	CRM	Antimony (Sb)-Dissolved	WG1657185-2	VA-HIGH-WATRM	1.04	1.00	mg/L	104.0	80-120	
Water	CRM	Arsenic (As)-Dissolved	WG1657185-2	VA-HIGH-WATRM	1.00	1.00	mg/L	100.3	80-120	
Water	CRM	Barium (Ba)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.4	80-120	
Water	CRM	Beryllium (Be)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.0999	0.100	mg/L	99.9	80-120	
Water	CRM	Bismuth (Bi)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.985	1.00	mg/L	98.5	80-120	
Water	CRM	Boron (B)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.89	1.00	mg/L	89.1	80-120	
Water	CRM	Cadmium (Cd)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.102	0.100	mg/L	101.9	80-120	
Water	CRM	Calcium (Ca)-Dissolved	WG1657185-2	VA-HIGH-WATRM	49.9	50.0	mg/L	99.9	80-120	
Water	CRM	Chromium (Cr)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.250	0.250	mg/L	99.9	80-120	

Water	CRM	Cobalt (Co)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.246	0.250	mg/L	98.5	80-120	
Water	CRM	Copper (Cu)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.240	0.250	mg/L	96.2	80-120	
Water	CRM	Iron (Fe)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.991	1.00	mg/L	99.1	80-120	
Water	CRM	Lead (Pb)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.498	0.500	mg/L	99.6	80-120	
Water	CRM	Lithium (Li)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.256	0.250	mg/L	102.4	80-120	
Water	CRM	Magnesium (Mg)-Dissolved	WG1657185-2	VA-HIGH-WATRM	50.9	50.0	mg/L	101.7	80-120	
Water	CRM	Manganese (Mn)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.4	80-120	
Water	CRM	Molybdenum (Mo)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.252	0.250	mg/L	100.8	80-120	
Water	CRM	Nickel (Ni)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.487	0.500	mg/L	97.3	80-120	
Water	CRM	Phosphorus (P)-Dissolved	WG1657185-2	VA-HIGH-WATRM	2.45	2.50	mg/L	97.8	80-120	
Water	CRM	Potassium (K)-Dissolved	WG1657185-2	VA-HIGH-WATRM	52.1	50.0	mg/L	104.2	80-120	
Water	CRM	Selenium (Se)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.991	1.00	mg/L	99.1	80-120	
Water	CRM	Silicon (Si)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.996	1.00	mg/L	99.6	80-120	
Water	CRM	Silver (Ag)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.103	0.100	mg/L	103.1	80-120	
Water	CRM	Sodium (Na)-Dissolved	WG1657185-2	VA-HIGH-WATRM	50.3	50.0	mg/L	100.5	80-120	
Water	CRM	Strontium (Sr)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.248	0.250	mg/L	99.2	80-120	
Water	CRM	Thallium (Tl)-Dissolved	WG1657185-2	VA-HIGH-WATRM	1.00	1.00	mg/L	100.4	80-120	
Water	CRM	Tin (Sn)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.503	0.500	mg/L	100.5	80-120	
Water	CRM	Titanium (Ti)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.255	0.250	mg/L	102.0	80-120	
Water	CRM	Uranium (U)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.00505	0.00500	mg/L	100.9	80-120	
Water	CRM	Vanadium (V)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.506	0.500	mg/L	101.2	80-120	
Water	CRM	Zinc (Zn)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.1	80-120	
Water	CRM	Zirconium (Zr)-Dissolved	WG1657185-2	VA-HIGH-WATRM	0.100	0.100	mg/L	100.1	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1658596-2	VA-HG-L-WATRM	0.00542	0.00500	ug/L	108.4	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1659148-2	VA-HG-L-WATRM	0.00477	0.00500	ug/L	95.5	80-120	
Water	LCS	Mercury (Hg)-Dissolved	WG1660067-2	VA-HG-L-WATRM	0.00500	0.00500	ug/L	100.1	80-120	
Water	MB	Aluminum (Al)-Dissolved	WG1657185-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Antimony (Sb)-Dissolved	WG1657185-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Arsenic (As)-Dissolved	WG1657185-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Barium (Ba)-Dissolved	WG1657185-1		<0.000020	<0.00002	mg/L	-	0.00002	
Water	MB	Beryllium (Be)-Dissolved	WG1657185-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Bismuth (Bi)-Dissolved	WG1657185-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Boron (B)-Dissolved	WG1657185-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Cadmium (Cd)-Dissolved	WG1657185-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Calcium (Ca)-Dissolved	WG1657185-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Chromium (Cr)-Dissolved	WG1657185-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Cobalt (Co)-Dissolved	WG1657185-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Copper (Cu)-Dissolved	WG1657185-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Iron (Fe)-Dissolved	WG1657185-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Lead (Pb)-Dissolved	WG1657185-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Lithium (Li)-Dissolved	WG1657185-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Magnesium (Mg)-Dissolved	WG1657185-1		<0.030	<0.03	mg/L	-	0.03	
Water	MB	Manganese (Mn)-Dissolved	WG1657185-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Molybdenum (Mo)-Dissolved	WG1657185-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Nickel (Ni)-Dissolved	WG1657185-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Phosphorus (P)-Dissolved	WG1657185-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Potassium (K)-Dissolved	WG1657185-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Selenium (Se)-Dissolved	WG1657185-1		<0.000040	<0.00004	mg/L	-	0.00004	
Water	MB	Silicon (Si)-Dissolved	WG1657185-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Silver (Ag)-Dissolved	WG1657185-1		<0.0000050	<0.000005	mg/L	-	0.000005	
Water	MB	Sodium (Na)-Dissolved	WG1657185-1		<0.010	<0.01	mg/L	-	0.01	
Water	MB	Strontium (Sr)-Dissolved	WG1657185-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Thallium (Tl)-Dissolved	WG1657185-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Tin (Sn)-Dissolved	WG1657185-1		<0.000010	<0.00001	mg/L	-	0.00001	
Water	MB	Titanium (Ti)-Dissolved	WG1657185-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Uranium (U)-Dissolved	WG1657185-1		<0.0000020	<0.000002	mg/L	-	0.000002	
Water	MB	Vanadium (V)-Dissolved	WG1657185-1		<0.000050	<0.00005	mg/L	-	0.00005	
Water	MB	Zinc (Zn)-Dissolved	WG1657185-1		<0.00050	<0.0005	mg/L	-	0.0005	
Water	MB	Zirconium (Zr)-Dissolved	WG1657185-1		<0.00010	<0.0001	mg/L	-	0.0001	
Water	MB	Mercury (Hg)-Dissolved	WG1658596-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1658596-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1658596-4		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1659148-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1659148-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1659148-4		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1659148-5		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1660067-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1660067-3		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Dissolved	WG1660067-4		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Dissolved	WG1658596-6	L1291154-18	0.00417	0.00500	ug/L	83.4	70-130	
Water	MS	Mercury (Hg)-Dissolved	WG1659148-6	Anonymous	0.267	0.005	ug/L	5330.	70-130	MS-B
Water	MS	Mercury (Hg)-Dissolved	WG1660067-10	L1291154-32	0.00491	0.00500	ug/L	98.1	70-130	
Aggregate Organics										
Water	LCS	BOD	WG1657072-2		176	198	mg/L	88.6	85-115	
Water	MB	BOD	WG1657072-1		<2.0	<2	mg/L	-	2	

Project
Report To David Derosa, TECK METALS LTD.
ALS File No. L1295778
Date Received 01-May-13 09:50
Date 08-May-13

REPLICATE RESULTS

Sample ID	Matrix	ALS ID	Analyte	Replicate 1	Replicate 2	Units	RPD	RPD Limit	Diff	Diff Limit	Qualifier
Physical Tests											
L1295778-1	Water	WG1663315-32	Conductivity	136	136	uS/cm	0.1	10	-	-	-
L1295778-1	Water	WG1663315-32	pH	7.81	7.75	pH	-	-	0.05	0.3	J
L1295778-7	Water	WG1662781-18	Turbidity	<0.10	<0.10	NTU	N/A	15	-	-	RPD-NA
Anions and Nutrients											
L1295778-1	Water	WG1664532-15	Alkalinity, Total (as CaCO3)	61.0	59.1	mg/L	3.1	20	-	-	-
L1295778-5	Water	WG1663194-13	Ammonia, Total (as N)	0.0324	0.0352	mg/L	8.0	20	-	-	-
L1295778-1	Water	WG1663545-3	Phosphorus (P)-Total Dissolved	<0.0020	<0.0020	mg/L	N/A	20	-	-	RPD-NA
L1295778-1	Water	WG1663545-3	Phosphorus (P)-Total	0.0043	0.0036	mg/L	16	20	-	-	-
Organic / Inorganic Carbon											
L1295778-4	Water	WG1665204-11	Total Organic Carbon	1.56	1.57	mg/L	0.6	20	-	-	-
Dissolved Metals											
L1295778-7	Water	WG1663603-4	Mercury (Hg)-Dissolved	<0.00050	<0.00050	ug/L	N/A	20	-	-	RPD-NA
Aggregate Organics											
L1295778-7	Water	WG1663481-3	BOD	<2.0	<2.0	mg/L	N/A	20	-	-	RPD-NA

Project
Report To David Derosa, TECK METALS LTD.
ALS File No. L1295778
Date Received 01-May-13 09:50
Date 08-May-13

QUALITY CONTROL RESULTS

Matrix	QC Type	Analyte	QC Spl. No.	Reference	Result	Target	Units	%	Limits	Qualifier
Physical Tests										
Water	CRM	Turbidity	WG1662781-2	VA-TURB-SPK-8	8.30	8.00	NTU	103.8	85-115	
Water	CRM	Turbidity	WG1662781-5	VA-TURB-SPK-8	8.37	8.00	NTU	104.6	85-115	
Water	CRM	Turbidity	WG1662781-8	VA-TURB-SPK-8	8.31	8.00	NTU	103.9	85-115	
Water	CRM	Turbidity	WG1662781-11	VA-TURB-SPK-8	8.32	8.00	NTU	104.0	85-115	
Water	CRM	Turbidity	WG1662781-14	VA-TURB-SPK-8	8.45	8.00	NTU	105.6	85-115	
Water	CRM	Turbidity	WG1662781-17	VA-TURB-SPK-8	8.32	8.00	NTU	104.0	85-115	
Water	CRM	Conductivity	WG1663315-17	VA-EC-PCT-CONTROL	146	147	uS/cm	99.0	90-110	
Water	CRM	Conductivity	WG1663315-18	VA-EC-PCT-CONTROL	143	147	uS/cm	97.3	90-110	
Water	CRM	Conductivity	WG1663315-19	VA-EC-PCT-CONTROL	144	147	uS/cm	98.3	90-110	
Water	CRM	Conductivity	WG1663315-20	VA-EC-PCT-CONTROL	144	147	uS/cm	98.1	90-110	
Water	CRM	Conductivity	WG1663315-21	VA-EC-PCT-CONTROL	146	147	uS/cm	99.3	90-110	
Water	CRM	Conductivity	WG1663315-22	VA-EC-PCT-CONTROL	146	147	uS/cm	99.3	90-110	
Water	CRM	Conductivity	WG1663315-23	VA-EC-PCT-CONTROL	146	147	uS/cm	99.1	90-110	
Water	CRM	pH	WG1663315-24	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	pH	WG1663315-25	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	pH	WG1663315-26	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1663315-27	VA-PH7-BUF	7.01	7.00	pH	7.01	6.9-7.1	
Water	CRM	pH	WG1663315-28	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1663315-29	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	pH	WG1663315-30	VA-PH7-BUF	7.02	7.00	pH	7.02	6.9-7.1	
Water	CRM	pH	WG1663315-38	VA-PH7-BUF	7.05	7.00	pH	7.05	6.9-7.1	
Water	CRM	Conductivity	WG1663315-39	VA-EC-PCT-CONTROL	147	147	uS/cm	99.9	90-110	
Water	LCS	Total Suspended Solids	WG1663230-2		78.8	75.0	mg/L	105.1	85-115	
Water	LCS	Total Suspended Solids	WG1663230-5		75.8	75.0	mg/L	101.1	85-115	
Water	LCS	Total Suspended Solids	WG1663230-8		81.8	75.0	mg/L	109.1	85-115	
Water	LCS	Total Dissolved Solids	WG1663244-2		397	425	mg/L	93.3	85-115	
Water	LCS	Total Suspended Solids	WG1663230-11		81.8	75.0	mg/L	109.1	85-115	
Water	LCS	Total Suspended Solids	WG1663230-14		82.8	75.0	mg/L	110.4	85-115	
Water	LCS	Total Suspended Solids	WG1663230-17		74.8	75.0	mg/L	99.8	85-115	
Water	MB	Turbidity	WG1662781-1		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1662781-4		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1662781-7		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Suspended Solids	WG1663230-1		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1663230-4		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1663230-7		<3.0	<3	mg/L	-	3	
Water	MB	Total Dissolved Solids	WG1663244-1		<10	<10	mg/L	-	10	
Water	MB	Conductivity	WG1663315-1		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-2		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-3		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-4		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-5		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-6		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-7		<2.0	<2	uS/cm	-	2	
Water	MB	Conductivity	WG1663315-8		<2.0	<2	uS/cm	-	2	
Water	MB	Turbidity	WG1662781-10		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1662781-13		<0.10	<0.1	NTU	-	0.1	
Water	MB	Turbidity	WG1662781-16		<0.10	<0.1	NTU	-	0.1	
Water	MB	Total Suspended Solids	WG1663230-10		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1663230-13		<3.0	<3	mg/L	-	3	
Water	MB	Total Suspended Solids	WG1663230-16		<3.0	<3	mg/L	-	3	
Anions and Nutrients										
Water	CRM	Ammonia, Total (as N)	WG1663194-2	VA-NH3-F	0.121	0.120	mg/L	101.1	85-115	
Water	CRM	Ammonia, Total (as N)	WG1663194-4	VA-NH3-F	0.120	0.120	mg/L	99.8	85-115	
Water	CRM	Ammonia, Total (as N)	WG1663194-6	VA-NH3-F	0.117	0.120	mg/L	97.5	85-115	
Water	CRM	Ammonia, Total (as N)	WG1663194-8	VA-NH3-F	0.117	0.120	mg/L	97.2	85-115	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1663545-2	VA-ERA-PO4	4.31	3.99	mg/L	108.0	80-120	
Water	CRM	Phosphorus (P)-Total	WG1663545-2	VA-ERA-PO4	4.44	3.99	mg/L	111.3	80-120	
Water	CRM	Phosphorus (P)-Total Dissolved	WG1663545-6	VA-ERA-PO4	4.68	3.99	mg/L	117.2	80-120	
Water	CRM	Phosphorus (P)-Total	WG1663545-6	VA-ERA-PO4	4.23	3.99	mg/L	106.1	80-120	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1664532-2	VA-ALKL-CONTROL	15.5	15.0	mg/L	103.5	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1664532-7	VA-ALKM-CONTROL	75.6	75.0	mg/L	100.8	85-115	
Water	CRM	Ammonia, Total (as N)	WG1663194-10	VA-NH3-F	0.116	0.120	mg/L	96.7	85-115	
Water	CRM	Alkalinity, Total (as CaCO3)	WG1664532-10	VA-ALKH-CONTROL	250	250	mg/L	99.8	85-115	
Water	LCS	Bromide (Br)	WG1662651-2		0.459	0.500	mg/L	91.8	85-115	
Water	LCS	Chloride (Cl)	WG1662651-2		101	100	mg/L	100.8	85-115	
Water	LCS	Fluoride (F)	WG1662651-2		1.06	1.00	mg/L	106.1	85-115	
Water	LCS	Nitrate (as N)	WG1662651-2		2.54	2.50	mg/L	101.4	85-115	
Water	LCS	Nitrite (as N)	WG1662651-2		0.504	0.500	mg/L	100.9	85-115	
Water	LCS	Sulfate (SO4)	WG1662651-2		101	100	mg/L	101.0	85-115	
Water	LCS	Total Kjeldahl Nitrogen	WG1663553-2		1.03	1.00	mg/L	103.2	75-125	
Water	LCS	Total Kjeldahl Nitrogen	WG1663553-6		0.992	1.00	mg/L	99.2	75-125	
Water	LCS	Bromide (Br)	WG1662651-15		0.453	0.500	mg/L	90.6	85-115	
Water	LCS	Chloride (Cl)	WG1662651-15		101	100	mg/L	100.8	85-115	
Water	LCS	Fluoride (F)	WG1662651-15		1.06	1.00	mg/L	105.5	85-115	
Water	LCS	Nitrate (as N)	WG1662651-15		2.54	2.50	mg/L	101.5	85-115	
Water	LCS	Nitrite (as N)	WG1662651-15		0.502	0.500	mg/L	100.5	85-115	
Water	LCS	Sulfate (SO4)	WG1662651-15		101	100	mg/L	100.8	85-115	
Water	MB	Bromide (Br)	WG1662651-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1662651-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1662651-1		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1662651-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1662651-1		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1662651-1		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1662651-4		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1662651-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1662651-4		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1662651-4		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1662651-4		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1662651-4		<0.50	<0.5	mg/L	-	0.5	

Water	MB	Bromide (Br)	WG1662651-7		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1662651-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1662651-7		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1662651-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1662651-7		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1662651-7		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Ammonia, Total (as N)	WG1663194-1		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1663194-3		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1663194-5		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1663194-7		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Ammonia, Total (as N)	WG1663194-9		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Phosphorus (P)-Total Dissolved	WG1663545-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1663545-1		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total Dissolved	WG1663545-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Phosphorus (P)-Total	WG1663545-5		<0.0020	<0.002	mg/L	-	0.002	
Water	MB	Total Kjeldahl Nitrogen	WG1663553-1		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Total Kjeldahl Nitrogen	WG1663553-5		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Alkalinity, Total (as CaCO3)	WG1664532-1		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1664532-6		<2.0	<2	mg/L	-	2	
Water	MB	Alkalinity, Total (as CaCO3)	WG1664532-9		<2.0	<2	mg/L	-	2	
Water	MB	Bromide (Br)	WG1662651-10		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1662651-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1662651-10		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1662651-10		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1662651-10		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1662651-10		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Bromide (Br)	WG1662651-13		<0.050	<0.05	mg/L	-	0.05	
Water	MB	Chloride (Cl)	WG1662651-13		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Fluoride (F)	WG1662651-13		<0.020	<0.02	mg/L	-	0.02	
Water	MB	Nitrate (as N)	WG1662651-13		<0.0050	<0.005	mg/L	-	0.005	
Water	MB	Nitrite (as N)	WG1662651-13		<0.0010	<0.001	mg/L	-	0.001	
Water	MB	Sulfate (SO4)	WG1662651-13		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Bromide (Br)	WG1662651-5	Anonymous	0.455	0.500	mg/L	91.0	75-125	
Water	MS	Chloride (Cl)	WG1662651-5	Anonymous	101	100	mg/L	101.1	75-125	
Water	MS	Fluoride (F)	WG1662651-5	Anonymous	1.09	1.00	mg/L	109.1	75-125	
Water	MS	Nitrate (as N)	WG1662651-5	Anonymous	2.56	2.52	mg/L	101.5	75-125	
Water	MS	Nitrite (as N)	WG1662651-5	Anonymous	0.505	0.502	mg/L	100.6	75-125	
Water	MS	Sulfate (SO4)	WG1662651-5	Anonymous	121	123	mg/L	98.0	75-125	
Water	MS	Chloride (Cl)	WG1662651-8	Anonymous	102	102	mg/L	100.3	75-125	
Water	MS	Nitrate (as N)	WG1662651-8	Anonymous	2.58	2.55	mg/L	101.1	75-125	
Water	MS	Nitrite (as N)	WG1662651-8	Anonymous	0.473	0.500	mg/L	94.6	75-125	
Water	MS	Sulfate (SO4)	WG1662651-8	Anonymous	120	122	mg/L	97.3	75-125	
Water	MS	Phosphorus (P)-Total Dissolved	WG1663545-4	L1295778-2	0.0427	0.0500	mg/L	85.4	70-130	
Water	MS	Phosphorus (P)-Total	WG1663545-4	L1295778-2	0.0486	0.0550	mg/L	87.2	70-130	
Water	MS	Total Kjeldahl Nitrogen	WG1663553-3	L1295778-5	1.10	40.1	mg/L	N/A	-	MS-B
Water	MS	Total Kjeldahl Nitrogen	WG1663553-7	Anonymous	1.10	40.1	mg/L	N/A	-	MS-B
Water	MS	Chloride (Cl)	WG1662651-11	Anonymous	136	141	mg/L	95.0	75-125	
Water	MS	Nitrate (as N)	WG1662651-11	Anonymous	2.50	2.50	mg/L	99.97	75-125	
Water	MS	Nitrite (as N)	WG1662651-11	Anonymous	0.473	0.500	mg/L	94.5	75-125	
Water	MS	Sulfate (SO4)	WG1662651-11	Anonymous	118	122	mg/L	96.2	75-125	
Water	MS	Bromide (Br)	WG1662651-14	L1295778-7	0.450	0.500	mg/L	90.1	75-125	
Water	MS	Chloride (Cl)	WG1662651-14	L1295778-7	101	100	mg/L	100.8	75-125	
Water	MS	Fluoride (F)	WG1662651-14	L1295778-7	1.08	1.00	mg/L	108.3	75-125	
Water	MS	Nitrate (as N)	WG1662651-14	L1295778-7	2.53	2.50	mg/L	101.3	75-125	
Water	MS	Nitrite (as N)	WG1662651-14	L1295778-7	0.504	0.500	mg/L	100.8	75-125	
Water	MS	Sulfate (SO4)	WG1662651-14	L1295778-7	101	100	mg/L	100.7	75-125	
Water	MS	Ammonia, Total (as N)	WG1663194-12	Anonymous	0.187	0.200	mg/L	93.7	75-125	
Water	MS	Ammonia, Total (as N)	WG1663194-14	L1295778-5	0.229	0.232	mg/L	98.3	75-125	
Organic / Inorganic Carbon										
Water	LCS	Total Organic Carbon	WG1665204-1		8.67	8.57	mg/L	101.1	80-120	
Water	LCS	Total Organic Carbon	WG1665204-3		8.38	8.57	mg/L	97.8	80-120	
Water	LCS	Total Organic Carbon	WG1665204-5		8.32	8.57	mg/L	97.0	80-120	
Water	LCS	Total Organic Carbon	WG1665204-7		8.45	8.57	mg/L	98.6	80-120	
Water	LCS	Total Organic Carbon	WG1665204-9		8.41	8.57	mg/L	98.2	80-120	
Water	MB	Total Organic Carbon	WG1665204-2		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1665204-4		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1665204-6		<0.50	<0.5	mg/L	-	0.5	
Water	MB	Total Organic Carbon	WG1665204-8		<0.50	<0.5	mg/L	-	0.5	
Water	MS	Total Organic Carbon	WG1665204-10	Anonymous	23.6	18.9	mg/L	N/A	-	MS-B
Water	MS	Total Organic Carbon	WG1665204-15	Anonymous	6.93	6.61	mg/L	106.4	70-130	
Total Metals										
Water	LCS	Mercury (Hg)-Total	WG1663603-3	VA-HG-L-WATRM	0.00520	0.00500	ug/L	103.9	80-120	
Water	MB	Mercury (Hg)-Total	WG1663603-1		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MB	Mercury (Hg)-Total	WG1663603-2		<0.00050	<0.0005	ug/L	-	0.0005	
Water	MS	Mercury (Hg)-Total	WG1663603-5	L1295778-7	0.00502	0.00500	ug/L	100.3	70-130	
Total Metals (Undigested)										
Water	CRM	Aluminum (Al)-Total	WG1663227-2	VA-HIGH-WATRM	2.00	2.00	mg/L	99.9	80-120	
Water	CRM	Antimony (Sb)-Total	WG1663227-2	VA-HIGH-WATRM	1.03	1.00	mg/L	102.6	80-120	
Water	CRM	Arsenic (As)-Total	WG1663227-2	VA-HIGH-WATRM	0.979	1.00	mg/L	97.9	80-120	
Water	CRM	Barium (Ba)-Total	WG1663227-2	VA-HIGH-WATRM	0.253	0.250	mg/L	101.1	80-120	
Water	CRM	Beryllium (Be)-Total	WG1663227-2	VA-HIGH-WATRM	0.0959	0.100	mg/L	95.9	80-120	
Water	CRM	Bismuth (Bi)-Total	WG1663227-2	VA-HIGH-WATRM	0.980	1.00	mg/L	98.0	80-120	
Water	CRM	Boron (B)-Total	WG1663227-2	VA-HIGH-WATRM	0.86	1.00	mg/L	86.2	80-120	
Water	CRM	Cadmium (Cd)-Total	WG1663227-2	VA-HIGH-WATRM	0.102	0.100	mg/L	102.2	80-120	
Water	CRM	Calcium (Ca)-Total	WG1663227-2	VA-HIGH-WATRM	48.9	50.0	mg/L	97.7	80-120	
Water	CRM	Chromium (Cr)-Total	WG1663227-2	VA-HIGH-WATRM	0.255	0.250	mg/L	102.1	80-120	
Water	CRM	Cobalt (Co)-Total	WG1663227-2	VA-HIGH-WATRM	0.246	0.250	mg/L	98.4	80-120	
Water	CRM	Copper (Cu)-Total	WG1663227-2	VA-HIGH-WATRM	0.239	0.250	mg/L	95.8	80-120	
Water	CRM	Iron (Fe)-Total	WG1663227-2	VA-HIGH-WATRM	0.977	1.00	mg/L	97.7	80-120	
Water	CRM	Lead (Pb)-Total	WG1663227-2	VA-HIGH-WATRM	0.477	0.500	mg/L	95.5	80-120	
Water	CRM	Lithium (Li)-Total	WG1663227-2	VA-HIGH-WATRM	0.240	0.250	mg/L	95.8	80-120	
Water	CRM	Magnesium (Mg)-Total	WG1663227-2	VA-HIGH-WATRM	51.2	50.0	mg/L	102.4	80-120	
Water	CRM	Manganese (Mn)-Total	WG1663227-2	VA-HIGH-WATRM	0.252	0.250	mg/L	101.0	80-120	
Water	CRM	Molybdenum (Mo)-Total	WG1663227-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.7	80-120	
Water	CRM	Nickel (Ni)-Total	WG1663227-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.1	80-120	
Water	CRM	Phosphorus (P)-Total	WG1663227-2	VA-HIGH-WATRM	2.58	2.50	mg/L	103.3	80-120	
Water	CRM	Potassium (K)-Total	WG1663227-2	VA-HIGH-WATRM	51.4	50.0	mg/L	102.8	80-120	

Water	CRM	Selenium (Se)-Total	WG1663227-2	VA-HIGH-WATRM	0.946	1.00	mg/L	94.6	80-120
Water	CRM	Silicon (Si)-Total	WG1663227-2	VA-HIGH-WATRM	1.02	1.00	mg/L	102.4	80-120
Water	CRM	Silver (Ag)-Total	WG1663227-2	VA-HIGH-WATRM	0.0999	0.100	mg/L	99.9	80-120
Water	CRM	Sodium (Na)-Total	WG1663227-2	VA-HIGH-WATRM	52.3	50.0	mg/L	104.6	80-120
Water	CRM	Strontium (Sr)-Total	WG1663227-2	VA-HIGH-WATRM	0.238	0.250	mg/L	95.1	80-120
Water	CRM	Thallium (Tl)-Total	WG1663227-2	VA-HIGH-WATRM	0.988	1.00	mg/L	98.8	80-120
Water	CRM	Tin (Sn)-Total	WG1663227-2	VA-HIGH-WATRM	0.497	0.500	mg/L	99.3	80-120
Water	CRM	Titanium (Ti)-Total	WG1663227-2	VA-HIGH-WATRM	0.254	0.250	mg/L	101.5	80-120
Water	CRM	Uranium (U)-Total	WG1663227-2	VA-HIGH-WATRM	0.00495	0.00500	mg/L	99.0	80-120
Water	CRM	Vanadium (V)-Total	WG1663227-2	VA-HIGH-WATRM	0.497	0.500	mg/L	99.4	80-120
Water	CRM	Zinc (Zn)-Total	WG1663227-2	VA-HIGH-WATRM	0.463	0.500	mg/L	92.6	80-120
Water	CRM	Zirconium (Zr)-Total	WG1663227-2	VA-HIGH-WATRM	0.0965	0.100	mg/L	96.5	80-120
Water	MB	Aluminum (Al)-Total	WG1663227-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Total	WG1663227-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Total	WG1663227-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Total	WG1663227-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Total	WG1663227-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Total	WG1663227-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Total	WG1663227-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Total	WG1663227-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Total	WG1663227-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Total	WG1663227-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Total	WG1663227-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Total	WG1663227-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Total	WG1663227-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Total	WG1663227-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Total	WG1663227-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Total	WG1663227-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Total	WG1663227-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Total	WG1663227-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Total	WG1663227-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Total	WG1663227-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Total	WG1663227-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Selenium (Se)-Total	WG1663227-1		<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Total	WG1663227-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Total	WG1663227-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Total	WG1663227-1		<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Total	WG1663227-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Total	WG1663227-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Total	WG1663227-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Total	WG1663227-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Total	WG1663227-1		<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Total	WG1663227-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Total	WG1663227-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Total	WG1663227-1		<0.00010	<0.0001	mg/L	-	0.0001
Dissolved Metals									
Water	CRM	Aluminum (Al)-Dissolved	WG1663228-2	VA-HIGH-WATRM	2.01	2.00	mg/L	100.6	80-120
Water	CRM	Antimony (Sb)-Dissolved	WG1663228-2	VA-HIGH-WATRM	1.03	1.00	mg/L	103.1	80-120
Water	CRM	Arsenic (As)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.988	1.00	mg/L	98.8	80-120
Water	CRM	Barium (Ba)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.244	0.250	mg/L	97.7	80-120
Water	CRM	Beryllium (Be)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.0985	0.100	mg/L	98.5	80-120
Water	CRM	Bismuth (Bi)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.981	1.00	mg/L	98.1	80-120
Water	CRM	Boron (B)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.88	1.00	mg/L	88.3	80-120
Water	CRM	Cadmium (Cd)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.104	0.100	mg/L	103.7	80-120
Water	CRM	Calcium (Ca)-Dissolved	WG1663228-2	VA-HIGH-WATRM	48.7	50.0	mg/L	97.3	80-120
Water	CRM	Chromium (Cr)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.257	0.250	mg/L	102.7	80-120
Water	CRM	Cobalt (Co)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.252	0.250	mg/L	100.8	80-120
Water	CRM	Copper (Cu)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.1	80-120
Water	CRM	Iron (Fe)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.988	1.00	mg/L	98.8	80-120
Water	CRM	Lead (Pb)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.491	0.500	mg/L	98.3	80-120
Water	CRM	Lithium (Li)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.245	0.250	mg/L	98.1	80-120
Water	CRM	Magnesium (Mg)-Dissolved	WG1663228-2	VA-HIGH-WATRM	51.5	50.0	mg/L	103.0	80-120
Water	CRM	Manganese (Mn)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.259	0.250	mg/L	103.7	80-120
Water	CRM	Molybdenum (Mo)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.252	0.250	mg/L	100.9	80-120
Water	CRM	Nickel (Ni)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.495	0.500	mg/L	99.0	80-120
Water	CRM	Phosphorus (P)-Dissolved	WG1663228-2	VA-HIGH-WATRM	2.60	2.50	mg/L	103.8	80-120
Water	CRM	Potassium (K)-Dissolved	WG1663228-2	VA-HIGH-WATRM	50.5	50.0	mg/L	101.0	80-120
Water	CRM	Selenium (Se)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.970	1.00	mg/L	97.0	80-120
Water	CRM	Silicon (Si)-Dissolved	WG1663228-2	VA-HIGH-WATRM	1.02	1.00	mg/L	102.2	80-120
Water	CRM	Silver (Ag)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.101	0.100	mg/L	101.2	80-120
Water	CRM	Sodium (Na)-Dissolved	WG1663228-2	VA-HIGH-WATRM	52.3	50.0	mg/L	104.6	80-120
Water	CRM	Strontium (Sr)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.243	0.250	mg/L	97.0	80-120
Water	CRM	Thallium (Tl)-Dissolved	WG1663228-2	VA-HIGH-WATRM	1.01	1.00	mg/L	100.7	80-120
Water	CRM	Tin (Sn)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.509	0.500	mg/L	101.7	80-120
Water	CRM	Titanium (Ti)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.274	0.250	mg/L	109.7	80-120
Water	CRM	Uranium (U)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.00503	0.00500	mg/L	100.7	80-120
Water	CRM	Vanadium (V)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.504	0.500	mg/L	100.9	80-120
Water	CRM	Zinc (Zn)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.466	0.500	mg/L	93.2	80-120
Water	CRM	Zirconium (Zr)-Dissolved	WG1663228-2	VA-HIGH-WATRM	0.0983	0.100	mg/L	98.3	80-120
Water	LCS	Mercury (Hg)-Dissolved	WG1663603-3	VA-HG-L-WATRM	0.00520	0.00500	ug/L	103.9	80-120
Water	MB	Aluminum (Al)-Dissolved	WG1663228-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Antimony (Sb)-Dissolved	WG1663228-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Arsenic (As)-Dissolved	WG1663228-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Barium (Ba)-Dissolved	WG1663228-1		<0.000020	<0.00002	mg/L	-	0.00002
Water	MB	Beryllium (Be)-Dissolved	WG1663228-1		<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Bismuth (Bi)-Dissolved	WG1663228-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Boron (B)-Dissolved	WG1663228-1		<0.0050	<0.005	mg/L	-	0.005
Water	MB	Cadmium (Cd)-Dissolved	WG1663228-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Calcium (Ca)-Dissolved	WG1663228-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Chromium (Cr)-Dissolved	WG1663228-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Cobalt (Co)-Dissolved	WG1663228-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Copper (Cu)-Dissolved	WG1663228-1		<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Iron (Fe)-Dissolved	WG1663228-1		<0.0010	<0.001	mg/L	-	0.001
Water	MB	Lead (Pb)-Dissolved	WG1663228-1		<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Lithium (Li)-Dissolved	WG1663228-1		<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Magnesium (Mg)-Dissolved	WG1663228-1		<0.030	<0.03	mg/L	-	0.03
Water	MB	Manganese (Mn)-Dissolved	WG1663228-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Molybdenum (Mo)-Dissolved	WG1663228-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Nickel (Ni)-Dissolved	WG1663228-1		<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Phosphorus (P)-Dissolved	WG1663228-1		<0.050	<0.05	mg/L	-	0.05
Water	MB	Potassium (K)-Dissolved	WG1663228-1		<0.050	<0.05	mg/L	-	0.05

Water	MB	Selenium (Se)-Dissolved	WG1663228-1	<0.000040	<0.00004	mg/L	-	0.00004
Water	MB	Silicon (Si)-Dissolved	WG1663228-1	<0.050	<0.05	mg/L	-	0.05
Water	MB	Silver (Ag)-Dissolved	WG1663228-1	<0.0000050	<0.000005	mg/L	-	0.000005
Water	MB	Sodium (Na)-Dissolved	WG1663228-1	<0.010	<0.01	mg/L	-	0.01
Water	MB	Strontium (Sr)-Dissolved	WG1663228-1	<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Thallium (Tl)-Dissolved	WG1663228-1	<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Tin (Sn)-Dissolved	WG1663228-1	<0.000010	<0.00001	mg/L	-	0.00001
Water	MB	Titanium (Ti)-Dissolved	WG1663228-1	<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Uranium (U)-Dissolved	WG1663228-1	<0.0000020	<0.000002	mg/L	-	0.000002
Water	MB	Vanadium (V)-Dissolved	WG1663228-1	<0.000050	<0.00005	mg/L	-	0.00005
Water	MB	Zinc (Zn)-Dissolved	WG1663228-1	<0.00050	<0.0005	mg/L	-	0.0005
Water	MB	Zirconium (Zr)-Dissolved	WG1663228-1	<0.00010	<0.0001	mg/L	-	0.0001
Water	MB	Mercury (Hg)-Dissolved	WG1663603-1	<0.00050	<0.0005	ug/L	-	0.0005
Water	MB	Mercury (Hg)-Dissolved	WG1663603-2	<0.00050	<0.0005	ug/L	-	0.0005
Aggregate Organics								
Water	LCS	BOD	WG1663481-2	183	198	mg/L	92.2	85-115
Water	LCS	BOD	WG1663481-5	191	198	mg/L	96.4	85-115
Water	MB	BOD	WG1663481-1	<2.0	<2	mg/L	-	2
Water	MB	BOD	WG1663481-4	<2.0	<2	mg/L	-	2