Site C Clean Energy Project
Water Quality Monitoring for
River Road, South Bank Initial Access Road,
BC Hydro Left Bank Debris Boom,
Right Bank Drainage Tunnel, R6 Slope and Area 21
2024 Annual Report

PRESENTED TO

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EXECUTIVE SUMMARY

Tetra Tech Canada Inc. (Tetra Tech) was retained by BC Hydro to develop and implement a surface water quality monitoring program for the BC Hydro Site C Clean Energy Project at midstream and discharge locations along River Road, in proximity to the South Bank Initial Access Road (SBIAR), and along the L3 Creek catchment. The River Road and SBIAR locations have been sampled monthly, except when frozen or dry conditions exist, since initiation of the program in 2017. Sampling at L3 Creek was terminated in April 2021 after a sufficient dataset of trends over time had been collected. Monitoring and sampling locations were added at the L2 Powerhouse Area from October 2020 until March 2023 during construction, and the BC Hydro Left Bank Debris Boom (LBDB) from October 2020 to July 2024. Sampling at LBDB was terminated on July 21, 2024 for inundation and filling of the reservoir. Details of the 2024 sampling locations, objectives, and requirements for testing at each location are presented in Section 5 of this report.

This water quality sampling program is conducted in accordance with BC Hydro Site C Clean Energy Project Construction Environmental Management Plan (CEMP), Rev. 12, Appendix E (Rev. 6.1) Acid Rock Drainage and Metal Leachate Management Plan - Section 5.2.1.7 (BC Hydro, Oct 4, 2023), which specifies requirements for road cut monitoring. This water quality program is one component of numerous water quality monitoring programs, including regular monitoring in the Peace River receiving environment, reported under separate cover (Ecofish, 2025a).

The monitoring program includes locations at the discharge points and at midstream locations as well as locations upstream from the discharge to characterize variation to water chemistry within the catchment due to mixing and inflow of water from multiple sources. Throughout the report the "RB" and "LB" nomenclature refers to right and left riverbanks (when facing downstream), respectively.

In accordance with the CEMP, results for the monitoring program locations are evaluated against the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture (BCAWQG).

Water quality measurements collected at discharge locations along River Road and downstream locations at SBIAR that exceed the BCAWQG-FST values are reported to BC Hydro within 24 hours of receiving the results, and subsequently to the provincial Emergency Management BC hotline, the Independent Environmental Monitor, and the office of the Comptroller of Water Rights. The complete results of sampling at all locations are presented in a monthly routine memo to BC Hydro.

The results of monthly monitoring are compiled and tracked for changes over time with special interest in metals associated with ARD/ML drainage, e.g., iron, aluminum, arsenic, cadmium, cobalt, copper, manganese, silver, and zinc. The trend charts are updated quarterly and included with the routine memo for that month's sampling event. The results of time series trend analysis are evaluated against the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture (BCAWQG) freshwater long-term (FLT) chronic values for sulphate since no short-term (FST) exceedance value is applicable.

River Road

Access road construction in 2016-2017, on the north/left bank, between Howe Pit and the Peace River along River Road cut through bedrock. Current mitigation along River Road adjacent to the PAG slopes includes a cut-off ditch above the slope, which diverts surface flows into limestone lined "Chimney ditches" which then feed into the River Road ditch below the slope. The River Road ditch adjacent to the PAG slope includes a bentonite liner and limestone rip-rap to provide neutralization potential and mitigate against acidic drainage. The limestone in the ditch was replaced in July 2021 to provide fresh surfaces for acid buffering.

A total of ten (10) monitoring locations were monitored in the River Road catchment to monitor the effectiveness of the limestone rip-rap in the ditch line and on the rock slope, and to observe longer term influences from the Potentially Acid Generating (PAG) rock cut and potential run-off/seepage from Howe Pit (non-Site C impacted area) on the water collected in the River Road ditch. Water quality sampling was attempted on a routine monthly basis from six of the River Road catchment locations, 1) in the lower chimney drain (LBRR-LC), 2) the upper chimney drain (LBRR-UC); 3) at the discharge of culvert RR-11 (LBRR-DD), 5) RR-9 culvert (LBRR-RR9) and 6) RR-8 culvert (LBRR-8). In situ testing, without lab sampling, is conducted at four additional locations within the River Road ditch at LBRR-12+600, LBRR-12+700, LBRR-12+810 and LBRR-12+920. Previously, since 2017, discharge from the outlet of culverts LBRR-DD, LBRR-RR9 and/or LBRR-RR8 were observed, which potentially reaches the Peace River, and in 2024 no flow was measured from the discharge location due to dry or frozen no flow conditions.

During 2024, outside of dry or frozen conditions, one lab sample was collected from River Road during one (1) sample event on June 26, 2024. The sample was collected from LBRR-EDP (June). In-situ water measurements were collected from at least one station during seven sample events through 2024. None of the three stations (LBRR-DD, LBRR-RR9 and LBRR-RR8) which discharge to the Peace River were sampled (in-situ or lab) in 2024 due to dry or frozen conditions.

Water quality measurements along River Road have indicated that run-off water quality is influenced by active acid rock drainage and metal leaching (ARD/ML) processes within the River Road ditch catchment, however neutral drainage conditions prevail and the elevated metals concentrations are generally attributed to sediment loading from the roadway or from sediment in the ditchline. Elevated metal levels at River Road have also been correlated in the past with periods of naturally elevated metals concentrations in the Peace River during freshet and after high precipitation events. As per CEMP Appendix E Section 5.2.1.7, it is recommended that water quality monitoring is continued on a monthly basis at the established locations within the River Road catchment.

In late autumn of 2024, construction for placement of a permanent cover along the up-gradient slope along RR commenced to provide long-term mitigation of acid generation from the slope. The upper River Road shale slope between approximately Station 12+730 to Station 12+900 was scraped of actively acid generating shale, to a depth of approximately 0.5 m prior to placement of geotextile and impermeable geomembrane.

SBIAR

The South Bank Initial Access Road (SBIAR) shale slope was initially exposed in 2015 as part of road construction works on the south bank between Relocated Surplus Excavation Material (RSEM) R6 and Area A. The total area of the shale slope is approximately 14,000 m^2, between both the East and West slopes. Management and mitigation measures include reduction of surface contact water through capture of up-gradient flow and diversion through a pipe to limit flow along the exposed shale slope, and collection of any remaining PAG contact water in ditches. It is noted that the water flowing in the ditches do not have a direct downstream receptor; the water from the east ditch passes under the road via culvert to the downstream location in the west ditch where all water flows into a limestone armored spillway into a ditch which conveys to the PRHP RSEM R6 pond (permitted for PAG contact water and subject to monitoring before discharge). The effectiveness of the mitigation is evaluated through monthly monitoring of water quality stations along the road.

In 2024, three (3) of the total four (4) monitoring locations were sampled at SBIAR, which included two stations in the east ditch and one station in the west ditch at the toe of the PAG slope exposure. The west downstream RBSBIAR-DS was sampled and not the west upstream RBSBIAR-US due to construction changes in the upper ditch. The east downstream RBSBIAR-EDS and upstream RBSBIAR-EUS locations were sampled. The sample stations are to monitor for potential long-term influence on water quality from construction of the SBIAR facility. Sampling at the SBIAR monitoring locations was conducted monthly from 2017 to 2024, with exception to quarterly in 2018.

During 2024, outside of dry or frozen conditions, lab samples were collected from SBIAR during eight (8) sampling events (March to October) resulting in a sum of fourteen (14) samples. Eight (8) samples were collected from RBSBIAR-DS (March to October), five (5) samples from RBSBIAR-EUS (April, July to October), and one (1) sample from RBSBIAR-EDS (June).

In situ testing was completed on a monthly basis, with sufficient water available at some, but not all, SBIAR locations for eight (8) months between March to October 2024. Frozen conditions in January, February, November and December prevented any sampling or in situ measurements. During the March 19, 2024 sample event, the SBIAR road ditches along the west side were noted to have had ice build-up removed from the winter season and the ice removal from the ditches resulted in some fresh shale exposure along the base and upslope side of the ditch. From March to October 2024, pH values measured at RBSBIAR-DS fluctuated to below and within the acceptable BCAWQG guideline range (pH 6.5 to 9.0). The March 19, 2024 sample event noted yellow-tinged flow on top of ice with a pH below the BCAWQG-FST guidelines. In the June 26, 2024 sample event, orange coloured staining in the water flow was noted at RBSBIAR-DS and RBSBIAR-EDS locations with a pH below the BCAWQG-FST guidelines at RBSIAR-DS.

During 2024, BCAWQG-FST exceedances were measured at the RBSBIAR-DS location for total iron (5), dissolved iron (5), total manganese (2), total cobalt (2), dissolved cadmium (2), dissolved copper (1), dissolved zinc (5), and pH (2) below the acceptable range (pH 6.5 – 9.0). No exceedances were measured in the east ditch at the RBSBIAR-EUS and RBSBIAR-EDS locations.

Powerhouse Area

Right Bank Powerhouse Drainage (RBDT) tunnel is excavated below the spillway and Powerhouse and ends under the dam core buttress at the center of the dam structure. The RBDT has 300+ drains installed along the tunnel, in pullouts and water is collected in sumps which is then collected and pumped out for treatment. Significant seepage occurred below the powerhouse in 2024 and portions of the tunnel were lined with shotcrete, steel and a foaming expanding synthetic grout to control the seepage. In 2024 water quality of sump water and seepage water was conducted

The RBDT portal entrance and/or RBDT-Sump location was sampled nine (9) times from May to December 2024. BCAWQG-FST exceedances were measured above the guidelines for total iron (2), ammonia (1), and pH (5) below the acceptable range (pH 6.5 – 9.0). Parameters measured above the BCAWQG-FLT for total aluminum (9), total arsenic (5), dissolved copper (5), dissolved zinc (1), nitrite (1), chloride (5), and ammonia (4), are noted for reference since are not under the CEMP.

The R6 shale slope is located adjacent to the Powerhouse to the east of the powerhouse structure and to the west of the RBDT portal. In summer of 2024 construction on the R6 Slope for permanent mitigation of exposed PAG was commenced. Construction consisted of progressive scraping of actively acid generating surficial material and placement of cover materials working up the slope. Rinse pH tests conducted on the shale material from R6 slope were conducted. Shale material excavated from the R6 slope were directed to the Area 21 Temporary PAG stockpile area.

Area 21 Temporary Stockpile Sump

A temporary stockpile was constructed in 2024 in the Area 21 laydown area to hold PAG material prior to ultimate disposal in an approved location. The stockpile was designed by Tetra Tech, with input from the geotechnical, hydrotechnical and QP-ARD teams for stockpile. Rinse pH tests were conducted on the stockpiled material during the Tetra Tech site audits to evaluate progression of acid generation in the stockpile and inform decision making on relocation of the material.

The source of material in the temporary stockpile, as well as the volume and extent of material in the pile varied during the 2024 year. This is an important consideration when reviewing and evaluating the Area 21 sump data from different time periods during the year. The construction of the Area 21 temporary stockpile pad location was completed at the end of 2023 for the initial purpose of holding PAG material excavations from the Approach Channel excavations. This stockpiled material was moved to the RSEM L5 Garbage Creek area for permanent disposal prior to reservoir flooding. The temporary stockpile received material from the R6 slope excavation in late summer 2024.

The new Area 21-Sump sample location was established in January 2024 and receives run-off from the Area 21 Temporary PAG stockpile area. No BCAWQG-FST exceedances were observed in the 2024 water quality sampling.

BC Hydro Left Bank Debris Boom

Shale was exposed during construction of the BC Hydro Left Bank Debris Boom (LBDB) anchor area in approximately March 2020. The LBDB PAG slope exposures will eventually be completely inundated with the reservoir formation. Water quality sampling at LBDB provides data to apply to understanding of water discharge and flooding in subsequent phases of increased elevation of the Peace River and during water diversion through the Diversion Tunnels. Sample locations were established and first sampled on October 8, 2020, to characterize water quality in the LBDB area for ARD-ML monitoring.

LBP Pond is the only location within the area that has been consistently available for sampling. Limited surface flow is observed in this area, and the only time that the sample stations in the LBDB area can be sampled, except for the LBP Pond location, is immediately following a significant rainfall event. In 2024, five sampling events occurred with samples at LBDB from March to July 2024. These ditches are otherwise generally dry.

During 2024, the LBP Pond was sampled five (5) times from March through July. No other samples were collected at LBDB during 2024 due to dry or frozen no flow conditions.

The LBP Pond samples reported three (3) BCAWQG-FST exceedances above the guidelines in total iron and dissolved zinc from March to July 2024. Water is not commonly observed to discharge from the LBP Pond, but if it does it passes through a limestone lined water management ditch system to the downstream monitoring station.

During the flooding of the reservoir in fall of 2024, the area of exposed PAG at the LBDB was inundated and is now permanently sub-aqueous. The area is inaccessible and no further monitoring will take place.

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
ARD	Acid Rock Drainage
ARD-ML	Acid Rock Drainage and Metal Leaching
BC MoE	BC Ministry of Environment and Climate Change Strategy Water Protection & Sustainability Branch
BCAWQG	British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture
°C	Degrees Celsius
CEMP	Construction Environmental Management Plan
DOC	Dissolved Organic Carbon
FB	Field Blank
FST	Freshwater Short-Term Maximum
FLT	Long-term Maximum
L/s	Litres per second
LBDB	Left Bank Debris Boom
LBRR	Left Bank River Road (referring to Sample ID)
Lorax	Lorax Environmental Services Ltd.
mg/L	milligrams per litre
ML	Metal Leaching
PAG	Potentially Acid Generating
PRHP	Peace River Hydro Partners
ppm	parts per million
RBSIBAR	Right bank South Bank Initial Access Road (referring to Sample ID)
RPD	Relative Percent Difference
RSEM	Relocated Surplus Excavation Material
SBIAR	South Bank Initial Access Road
TB	Travel Blank
µg/L	micrograms per litre
WQG	Water Quality Guideline

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of BC Hydro and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than BC Hydro, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) was retained by BC Hydro (the client) to develop and implement a surface water quality monitoring program at locations around the Site C Clean Energy Project site where bedrock shale exposures, classified as potentially acid generating (PAG), may have the potential to contribute to water quality changes due to acid rock drainage and metal leaching (ARD-ML) potential of the shale bedrock.

We acknowledge this work is being conducted on the traditional territory of Treaty 8 First Nations of Dunne Zaa, Cree and Tse'khene cultural descent.

Monitoring locations were established by Tetra Tech in conjunction with BC Hydro personnel. The initial sample program was designed so that locations were coincident, where possible and applicable, with the locations and station names used in 2016 by Lorax Environmental Services Ltd. (Lorax) for water quality monitoring on behalf of Peace River Hydro Partners (PRHP) prior to BC Hydro taking over sampling of these stations. The initial sampling was program focused on rock cuts at River Road and South Bank Initial Access Road where the water conveyance facilities were identified as having potential for direct ARD-ML impacts due to exposure of shale bedrock during construction related activities. These two locations have been subject to monitoring since program initiation in 2017 and have continued though 2024. Additional sampling stations have been added and removed throughout the years as construction progressed. The areas reviewed and stations sampled in 2024 are discussed in this report.

The monitoring program includes locations at the discharge points and at midstream locations as well as locations upstream from the discharge to characterize variation to water chemistry within the catchment due to mixing and inflow of water from multiple sources. Sampling events are completed monthly, and samples are collected outside of frozen or no flow conditions.

This report documents the sampling events conducted monthly between January and December of 2024 and the results of water quality monitoring. Results are discussed in the context of ARD-ML management and mitigation for the PAG shale areas on-site.

2.0 MONITORING PROGRAM SET-UP AND PURPOSE

The monitoring locations are visited monthly, and samples are collected except under frozen or dry conditions. The 2024 monitoring period commenced with the first sample event on January 21, 2024 and was completed with the twelfth and final sample event of the year on December 20, 2024. Each sampling event was completed by BC Hydro personnel and was documented by field notes and photographs, including during dry and frozen conditions.

2.1 Monitoring Program Requirements and Comparison Criteria

Requirements for the development and implementation of the water quality monitoring programs are mandated under the Environmental Assessment Certificate – Condition 3, and the Federal Decision Statement – Condition 7. Reporting of the program results are required on an annual basis. These requirements were carried forward and presented in the BC Hydro Site C Clean Energy Project Construction Environmental Management Plan (CEMP), Revision 12 (October 23, 2023), Appendix E (Rev 6.1) Acid Rock Drainage and Metal Leachate Management Plan (October 4, 2023).

In accordance with the CEMP Appendix E Section 5.2.1.7, analytical results for all monitoring locations are evaluated against the British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture (BCAWQG) freshwater short-term maximum (FST) values [1](BC MOE, 2024). Water quality measurements recorded at the sampling stations are reported to BC Hydro within 24 hours of receiving lab results, and a routine memo is prepared on a monthly basis to summarize field in situ and analytical lab results. The monthly results are compiled for long-term trend analysis in trend charts. The long-term trends data is evaluated against the BCAWQG freshwater long-term (BCAWQG-FLT) chronic values in Appendix B, Tables B1 to B5 and trend charts in Figure 6 to 44.

Water quality measurements collected at discharge locations to the Peace River that exceed the BCAWQG-FST values are reported to BC Hydro within 24 hours of receiving the results, and subsequently to the provincial Emergency Management BC hotline, the Independent Environmental Monitor, and the office of the Comptroller of Water Rights. The complete results of sampling at all locations are presented in a monthly routine memo to BC Hydro.

Under BCAWQG, the intention of freshwater long-term (FLT; “chronic”) WQG’s are for the protection of the most sensitive species and life stage against sub-lethal and lethal effects for indefinite explores, and uses an averaging period, whereas the freshwater short-term (FST; “acute”) WQG’s are intended to protect against severe effects, e.g., lethality, to the most sensitive species and life stage over a defined short-term exposure period approach (BC MOE, 2024). Results are compared to both guidelines for the purpose of tracking individual sample events and trend monitoring over longer periods.

2.2 Analytical Program Parameters

In situ water quality testing is completed during the field investigation and sampling program. The in situ monitoring program includes measurements of pH, electrical conductivity, alkalinity, hardness, water temperature and estimated flow. In situ monitoring is completed at all stations where flow is noted. Water samples are collected at select locations for off-site analytical testing of water quality.

The off-site laboratory analytical program was designed to measure a suite of parameters suitable for screening the water quality against the BCAWQG-FST for surface water. The sampling and analytical procedures implemented during 2024 were commensurate with Tetra Tech’s monitoring programs from 2017 to 2023, and the program previously implemented in 2016 by Lorax for parameters, analytical methods, and detection limits. Samples were collected in a set of clean bottles provided by the lab and were submitted for analysis.

Analysis was conducted for the following parameters:

- Total Metals, Low Level (including Hg);
- Dissolved Metals, Low Level (including Hg);
- Hardness;
- pH;
- Alkalinity: Total/Species (CO_3^{2-} , HCO_3^-, OH^-);

[1] The British Columbia Approved Water Quality Guidelines: Aquatic Life, Wildlife and Agriculture document has been updated frequently during the course of the monitoring program, and has undergone revisions in March 2016, January 2017, March 2018, August 2019, September 2021, November 2023, and August 2024. Screening of the monthly water quality results are compared to the guidelines at the time of reporting.

- Acidity;
- Solids: Total Suspended (TSS) and Total Dissolved (TDS);
- Anions: Nitrogen species (nitrite, nitrate, ammonia), Sulphate, Chloride; and
- Dissolved Organic Carbon (DOC).

2.3 Summary of Parameters of Interest

Geochemical modelling completed by Klohn Crippen Berger (2015) identified copper, cobalt, cadmium, and zinc as having high probability of leaching into solution of site water during oxidation of the local shale bedrock under toxic acid rock generating and metal leaching conditions.

Water quality screening efforts have focused on these elements and others with BCAWQG-FST guidelines, which include pH, ammonia, chloride, nitrite, total concentrations of arsenic, boron, cobalt, iron, lead, manganese, molybdenum, silver, and zinc, and dissolved concentrations of aluminum, cadmium, and iron. Changes in concentrations of some elements or metals, reported as both total and dissolved, can have various implications for water quality under ARD-ML conditions. The solubility of individual elements can vary with pH. Discussion of key parameters of interest and association with ARD/ML is discussed below.

- Alkalinity and pH are important water quality parameters to indicate the ratio between residual alkalinity and acidity in solution and are key indicators for onset of acidic conditions within neutral to alkaline waters when monitored over time.
  - Neutralization of acidity by carbonate, and to a lesser degree silicate, minerals can temporarily increase alkalinity through release of the bicarbonate ion into solution, thereby buffering pH at a near constant value.
  - Bicarbonate will continue to react with, and deplete, any residual acidity. Once all carbonate and bicarbonate sources are depleted, alkalinity no longer is available to neutralize acidity and pH will drop. An indicator for accelerating acid generating processes is when increasing alkalinity is observed without proportional change to pH.
  - The BCAWQG-FST guideline for pH ranges from 6.5-9.0. There is no BCAWQG-FST guideline for alkalinity or acidity.
- Water clarity is measured as turbidity (nephelometric turbidity units, NTU) or as total suspended solids (TSS), which is an indicator of the amount of sediment (generally accepted as silt sized particles and coarser, or >0.45 µm in diameter), contained within the water column.
  - TSS can increase if sediment loading occurs due to erosion, or due to rapid precipitation of secondary minerals from chemical reactions such as neutralization of acidic water. The bulk chemistry of water with high TSS tends to mimic the chemical composition of the source sediment being eroded, or in the case of mineral precipitation tends to be high in iron as iron-oxide minerals are the most common secondary mineral to form.
  - Rapid temporal changes to TSS measurements within a catchment due to formation of secondary minerals can indicate presence of active ARD-ML reactions. The BCAWQG-FST guideline is based on deviations relative to background TSS.
- Measurements such as total dissolved solids (TDS), electrical conductivity (EC) and salinity are indicators for the concentration of dissolved components and/or ions in solution. Sudden or gradual increases in these parameters can indicate changes in water chemistry such as an increase in reactive ions or dissolved metals

as a result of potential metal leaching processes. Changes to these parameters in association with changes to pH or alkalinity may also indicate active metal leaching processes. BCAWQG-FST guidelines are not defined for these parameters.

- Dissolved sulphate can originate from anthropogenic sources, microbial processes and through chemical processes related to degradation of rock forming minerals in environments with potential for acid generation through the oxidation of primary sulphide (e.g., pyrite) or dissolution of sulphate minerals (e.g., gypsum). Elevated sulphate concentrations may indicate oxidation, or weathering, of PAG materials in proximity to sample collection locations, however, it may also indicate influence from regional groundwater sources.
  - Water quality with elevated sulphate and pH > 7.0 may indicate ARD-ML processes with sufficient acid neutralizing materials, whereas sulphate with decreasing pH may indicate a shortage of acid neutralizing materials. Sulphate is commonly reactive with several cations and metal ions under ambient environmental conditions forming both soluble and non-soluble mineral precipitates.
  - The guideline value for sulphate is not stated in the short-term BCAWQG-FST guideline, however, a long-term average guideline value is stated (variable with hardness) and is referenced in this report.
  - Groundwater monitoring from 2016-2020 up-gradient and down-gradient of RSEM R5a and R5b measured elevated sulphate concentrations below the BCAWQG-FLT guideline, as reported in the Site C Clean Energy Project, 2020 Q4 Groundwater Quality, Monitoring Report for RSEM R5a and R5b (Lorax, 2020). These results indicate the presence of sulphate in the groundwater systems. It is noted that the down-gradient monitoring wells at RSEM R5b were screened in overburden materials above the bedrock contact.
- Marine shales such as the local Shaftsbury Formation commonly contain sulphide minerals (mainly pyrite, FeS_2) and may also have primary sulphate minerals such as anhydrite ($CaSO_4$), gypsum ($CaSO_4 \cdot 2H_2O$), or barite ($BaSO_4$), and/or other sulphate minerals.
  - Preliminary characterization determined that the primary sulfur species in the shale was sulphide with some detectable sulphate (Klohn Crippen Berger, 2015). Based on this mineral association and site observations, it is possible that groundwater contacting fractured bedrock could contain naturally elevated sulphate concentrations. Only one well from the Main Civil Works (MCW) Site was reported in the baseline groundwater sampling conducted as part of the project's Environmental Impact Statement (Hemmera Envirochem Inc. and BGC Engineering Inc., 2012) which did indicate groundwater contained elevated sulphate.
- Water hardness is derived from the total concentration of calcium and magnesium ions in solution, and often reported as mg/L of dissolved $CaCO_3$) is known to mitigate the effect of certain metals on aquatic organisms. Water hardness classification on-site is Hard to Very Hard (180 to >250 mg/L, and up to 1,000 mg/L, dependent on location) and is often measured above the guideline threshold used to calculate BCAWQG-FST guideline values. Where the ambient hardness values exceed the guideline limited listed for BCAWQG, the exceedance criteria have been calculated using the upper limit "capped" hardness value instead of the measured ambient hardness. The BCAWQG values for multiple elements is based on water hardness.
- Formation of iron-oxide precipitate is a widely recognized indicator of active ARD-ML processes. Total iron concentrations are associated with ARD-ML due to liberation of ferric iron from the oxidation of primary iron bearing sulphides. Subsequent formation of iron-oxide or iron hydroxide minerals can precipitate when acidic waters are neutralized and may be present as suspended solids or can form scaling on reactive surfaces such as limestone.
- Aluminum is abundant in rock forming minerals and can be released as part of oxidation and degradation of rocks during ARD-ML processes. Aluminum is soluble in acidic water and is typically not soluble in neutral and alkaline waters. Aluminum, as Al3+, can also contribute to the acidity along with H+. When concentrations of

aluminum are measured in detectible concentrations in neutral or alkaline water, it is possible that the formation of very fine aluminum hydroxide clays may occur in previously acidic waters that have been neutralized. Aluminum hydroxide mineral species (e.g., polymorphs of gibbsite or hydrargillite) can form on rock surfaces and are indicators of acid generating conditions. Precipitation of aluminum and iron hydroxide produced by weathering may occur on and reduce the exposure of acid generating and acid neutralizing minerals. (Price, 2009).

- Concentrations of aluminum, iron and copper are typically low in neutral pH drainage, however, elements such as antimony, arsenic, cadmium, molybdenum, selenium, and zinc can be present in neutral pH drainage (BC MEM, 1998). Neutral pH metal leaching is an important mechanism to be observed on the Site C project as several of these neutral pH soluble elements are prevalent in the shale bedrock. These elements can be concentrated within secondary mineral formation on shale bedrock during prolonged period of low moisture, then released into run-off water in elevated concentration during high precipitation events.

3.0 SAMPLE LOCATIONS

A list of sample locations is provided in the attached Table 1 and the locations are shown on Figures 1 through 3. A summary of the rock cut locations that are subject to monthly monitoring are presented in the following sections, along with a description of the monthly sampling and in situ testing locations. Photos of the water sampling locations during 2024 are included in the Photographs (1 through 27) section of the Appendix.

3.1 Description of River Road Site and Sample Locations

Access road construction in 2016-2017, on the north/left bank, between Howe Pit and the Peace River along River Road cut through bedrock. ARD-ML management and mitigation along River Road adjacent to the PAG slopes includes a cut-off ditch above the slope, which diverts surface flows into limestone lined “Chimney ditches” which then feed into the River Road ditch below the slope. The River Road ditch adjacent to the PAG slope includes a bentonite liner and limestone rip-rap to provide neutralization potential and mitigate against acidic drainage. The limestone has been periodically to provide fresh surfaces for acid buffering. In 2024, long-term mitigation of the shale slopes was addressed with the application of a cover system, discussed below.

3.1.1 Monitoring Locations

Sample locations are established along the River Road ditch for in situ testing, primarily as a means of monitoring the effectiveness of the limestone rip-rap and to observe longer term trends related to the PAG rick cut at River Road and run-off/seepage from Howe Pit. A total of ten (10) monitoring locations are established in the River Road catchment, shown in Figure 1. The River Road ditch was refreshed with new limestone in July of 2021. See Section 5.3 for additional discussion of management and mitigation of ARD-ML in this area.

The six sample stations include 1) lower chimney drain (LBRR-LC), 2) upper chimney (LBRR-UC), 3) upstream of the lower chimney drain within the River Road ditch (formerly LBRR-12+500, was sampled at LBRR-12+450 during 2022 due to significant rip-rap over the channel), 4) discharge of culvert RR-11 (LBRR-DD), and downstream drainage culvert outlets at 5) RR8 and 6) RR9. The four stations with in situ monitoring only stations include LBRR-12+600, LBRR-12+700, LBRR-12+810 and LBRR-12+920.

The River Road Ditch Diversion pipe, installed in March 2018, is to address erosion and sediment control by transport of run-off water into an elongated ditchline to reduce flow velocities and to promote settlement of suspended sediment. Inlets to culverts RR9 and RR8 are slightly elevated from the ditch base which will allow water to pond within the ditch and infiltrate or discharge via the culverts only if water levels reach sufficient height.

Both culverts are made of HDPE materials. The monitoring program includes sampling of discharge from these LBRR-RR8 and LBRR-RR9 culverts. Water flow is rarely observed at these two discharge stations, and in 2024 no flow and no sampling was completed at these locations. This is due to the design of the ditch to deposit sediment and infiltrate before reaching the culverts.

The established River Road monitoring locations are shown in Figure 1 and photos of the locations are included in the Photographs section of the Appendix. Water quality lab data results are provided in Appendix B, Table B1 and discussed in Section 5.3.

3.1.2 River Road Slope, Limestone Ditch and Maintenance

Mitigation measures during dam site construction along River Road adjacent to the PAG slopes included a cut-off ditch above the slope, which diverts surface flows into limestone lined “Chimney ditches” which feed into the River Road ditch below the slope. The River Road ditch adjacent to the PAG slope included a bentonite liner and limestone rip-rap to provide neutralization potential and mitigate against acidic drainage.

The placed limestone rip-rap is effective at mitigating the pH of the drainage when there are fresh surfaces of limestone available for chemical reactions. Potentially acidic leachate generated from the rock cut-slopes reacts with the alkaline limestone to help neutralize water as it passes through the rip-rap lined ditch. Mineral precipitates can accumulate on rip-rap over time which reduce the effectiveness of the limestone. Periodic refreshing or replacement of limestone has been completed over the life of the project. No maintenance activities were completed in 2022 or 2023 as the limestone continued to work effectively with minor precipitate coatings noted as well as road sediment encroachment. Work in 2024 included permanent mitigation measures for long-term management of PAG from the River Road Slope.

With increased use of River Road, sediment and erosion control measures are needed to be addressed to manage the sediment load coming off of the road and into the ditch. The limestone is monitored for accumulation of precipitates and sediment and refreshed either by cleaning or replacement as needed.

Maintenance 2017-2020

In 2017, the collection ditch on the cut-bank (north) side of River Road between approximately 12+340 and 12+960 was lined with limestone rip-rap to assist with mitigating the potential effects of ARD-ML from PAG bedrock that was exposed during the initial road construction in 2015 and early 2016. Limestone was also placed between stations LBRR+920 and LBRR-DD to manage the pH of baseline drainage water at the outflow location. Limestone rip-rap within the ditch between road stations 12+600 and 12+900 continued to be maintained in 2018, including completion of a hydroseeding program and a limestone buttress as the toe of the shale slope to support long-term erosion control and slope stability in March 2018. The hydroseed appeared to remain in place on the slope, however, germination was not successful at year’s end. No maintenance activities were completed in 2020.

Maintenance in 2021

In early July 2021, rip-rap was replaced with fresh limestone up to but not including under the diversion pipe. During limestone replacement, the contractor also removed and replaced the previously installed bentonite liner with a new bentonite liner.

Maintenance in 2022 and 2023

No maintenance requirements for limestone in 2022 and 2023.

Maintenance in 2024

In early 2024, road maintenance along River Road unintentionally graded a large amount of road surfacing material into the limestone lined ditches on the north side of River Road. The limestone rip-rap was buried under road material and no longer functioned as mitigation for the PAG contact water coming down the slope. It was decided that in place of re-establishing the ditch and replacing the limestone, that a permanent cover system for the PAG slope would be advanced in 2024 instead of waiting for the permanent site road construction planned for 2026.

A cover system for the cut-bank on the north side of River Road between the upper chimney and lower chimney ditches was designed to mitigate the acid generating exposure on the slope in the long-term. The extents of the cover system was supported by field rinse pH tests to define areas of active acid generation, and to confirm depth of scraping on the slope prior to cover placement.

Construction of the slope cover between approximately 12+730 and 12+900 commenced in November of 2024, and includes scraping of the top layer of weathered and actively acid generating shale, to reach shale with a circa-neutral pH, and partial placement of geotextile, and impermeable geomembrane.

In addition, a cover design for the cut-off ditch up-gradient of River Road was designed, including scraping of the ditch to remove active acid generating material, application of ag-lime in areas where scraping was not feasible and placement of a bentonite liner in the base of the ditch to prevent further oxidation of PAG materials. In 2024 the access to the ditch for construction was established and the ditch was cleaned out and graded to its final geometry.

The cover of the upper River Road slope and cut-off ditch was completed in February 2025. Detailed design of a similar cover for the shale slope adjacent to the lower chimney ditch will be completed in 2025.

3.2 Description of South Bank Initial Access Road Site and Sample Locations

The South Bank Initial Access Road (SBIAR) shale slope was initially exposed in 2015 as part of road construction works on the south bank between Relocated Surplus Excavation Material (RSEM) R6 and Area A. The total area of the shale slope is approximately 14,000 m^2, between both the East and West slopes.

Management and mitigation measures includes reduction of surface contact water through capture of up-gradient flow and diversion through a pipe to limit flow along the exposed shale slope, and collection of any remaining PAG contact water in ditches which is captured and conveyed to PRHP RSEM R6 Settlement Ponds (permitted for PAG contact water). The effectiveness of the mitigation is evaluated through monthly monitoring of water quality stations along the road, and visual inspection of the slopes and ditches during the ARD/ML audit inspections.

3.2.1 Monitoring Locations

A total of four (4) monitoring locations are established in the SBIAR catchment to monitor water quality flowing in the SBIAR ditches at the toe of the SBIAR road cut. The four sample locations allow for data collection from the east and west SBIAR ditches. This provides long-term characterization of SBIAR water management from the upstream location in the west ditch (RBSBIAR-US) and the downstream location in the west ditch (RBSBIAR-DS), as well as upstream and downstream sampling locations in the east ditch, (RBSBIAR-EUS and RBSBIAR-EDS, respectively).

The established RBSBIAR monitoring locations are shown in Figure 2 and photos of the locations are included in the Photographs section of the Appendix. Water quality lab data results are provided in Appendix B, Table B2 and discussed in Section 5.4.

It is noted that the water flowing from the downstream locations do not have a direct downstream receptor; the water from the east ditch passes under the road via culvert to the downstream location in the west ditch where all water flows into a limestone armored spillway into a ditch which conveys to the PRHP RSEM R6 pond. There is an intensive water quality monitoring program in the pond (continuous in situ measurements of pH, conductivity; daily lab analysis for all parameters) conducted prior to discharge by Lorax (Lorax, 2025), Ecofish Research Ltd. (Ecofish 2025a) and others, as well as Peace River receiving environment monitoring conducted by Ecofish (Ecofish, 2025b) and others.

3.2.2 Site Maintenance

In late March 2024, ditch cleaning to remove ice in the SBIAR west ditch exposed fresh shale at the base of the During the April 2024 site audit, slope material from the SBIAR west and east ditches was tested by rinse pH to acquire pH values of between 2.45 to 6.30 from the exposed shale material.

3.3 Description of Powerhouse Area and Adjacent Area to Right Bank Drainage Tunnel and Sampling Locations

3.3.1 Description of L2 Powerhouse Samples

During construction of the Site C powerhouse on the right bank, from November 2020 to December 2022, the powerhouse area was sampled to establish upstream and downstream water quality characterization and ARD-ML PAG slope monitoring adjacent to the powerhouse. The upstream L2-US and downstream L2-DS sample locations at the L2 Powerhouse were selected due to a shale slope exposed during excavation for the powerhouse. The RB Foundation Enhancement work (January 2022) included additional shale excavation. Mitigation and monitoring were addressed as per the site's EPPs. The L2 Powerhouse was an area of active construction with the possibility to influence the results of sampling month to month. The water management at this area was complex with likely multiple sources of water input and discharges.

3.3.2 Description of RBDT Sampling Locations

The Right Bank Drainage Tunnel (RBDT) is an approximately 1.123 km long groundwater dewatering tunnel that was excavated within shale bedrock under the Roller Compacted Concrete (RCC) Buttress by Peace River Hydro Partners (PRHP) to provide reduction of hydrostatic pressures for stability under the Right Bank Dam abutment infrastructure foundations. Construction of the facility began in July 2016 and was completed in January 2019 (PRHP, 2020). The RBDT sampling is not part of the main Site C ARD/ML monthly sampling program but considered useful to BC Hydro to guide future management decisions.

During construction of the Right Bank Drainage Tunnel (RBDT), water quality sampling was completed along eleven locations in the tunnel on July 6, 2020 (5 locations), February 22, 2021 (7 locations), and June 7, 2023 (1 location).

In 2024, the RBDT and RBDT-Sump locations were sampled thirteen (13) times between January to December. The RBDT location is sampled from a discharge valve line near the tunnel entrance and the RBDT-Sump location is sampled from a sump approximately 685 metres further inside the tunnel where the RBDT Access intersects the main tunnel.

On January 21, 2024, sampling of the tunnel seepage water from the RBDT commenced on a monthly basis. All tunnel water is being pumped from a catchment sump within the tunnel to the pre-treatment pond in R6. On January 21, 2024, a sample was collected directly from the sump inside the tunnel as PRHP was in the process of installing a new line to keep up with increased flows and planning to install a valve at one of the connections. Moving forward into February 2024, it was planned to sample from the main line outside the tunnel before it discharges into the pre-treatment pond. During the May 26, 2024, sampling event, an in situ measurement from both the RBDT and RBDT-Sump locations were compared and found to measure similarly.

Water quality lab data results are provided in Appendix B, Table B3 and discussed in Section 5.5. A map showing the locations is in Figure 2.

3.3.3 Description of R6 Slope Activities

The R6 shale slope is located adjacent to the Powerhouse to the east of the powerhouse structure and to the west of the RBDT portal. In August 2024, construction on the R6 slope was initiated for geotechnical purposes. The construction included foundation preparation to remove weathered shale bedrock from the existing slope such that a Zone 3 material cover could be placed against unweathered and geotechnically sound bedrock. The existing slope was benched back in temporary excavations in 10 m sections, with each section backfilled with Zone 3b before the next is excavated. The Zone 3b material was then covered with a Zone 5 limestone rip-rap. Water from the slope is captured in the limestone lined spillway drainage channel.

The excavated material from the R6 slope was transported and stockpiled to the Area 21 Temporary PAG disposal area. No in situ or lab water quality samples were collected from the R6 Slope source area during or post-construction due to access issues.

3.4 Description of Area 21 Sump Location

A temporary stockpile was constructed in 2024 in the Area 21 laydown area to hold PAG material prior to ultimate disposal in an approved location. The stockpile was designed by Tetra Tech, with input from the geotechnical, hydrotechnical and QP-ARD teams for stockpile. Rinse pH tests were conducted on the stockpiled material during the Tetra Tech site audits to evaluate progression of acid generation in the stockpile and inform decision making on relocation of the material.

The source of material in the temporary stockpile, as well as the volume and extent of material in the pile varied during the 2024 year. This is an important consideration when reviewing and evaluating the Area 21 sump data from different time periods during the year. The construction of the Area 21 temporary stockpile pad location was completed at the end of 2023 for the initial purpose of holding PAG material excavations from the Approach Channel excavations. This stockpiled material was moved to the RSEM L5 Garbage Creek area for permanent disposal prior to reservoir flooding. The temporary stockpile received material from the R6 slope excavation in late summer 2024.

The new Area 21-Sump sample location was established in January 2024 and receives run-off from the Area 21 Temporary PAG stockpile area.

Water quality lab data results are provided in Appendix Table B4 and discussed in Section 5.5. A map showing the locations is in Figure 2.

3.5 Description of BC Hydro Left Bank Debris Boom Sampling Locations

Shale was exposed during construction of the BC Hydro Left Bank Debris Boom (LBDB) anchor area in approximately March 2020. In September 2020, the river at Phase 1 elevation (~410 m) followed by a partial block and diversion of the Peace River to allow construction of the main Site C dam in October 2020, causing the river/reservoir to flood up to Stage 2 levels (~417-420 m). The final river/reservoir elevation is ~ 460 m.

The ditches above the 420 m elevation are lined with 3–10-inch size fraction limestone as a management measure to provide additional buffering capacity to leachate entering the ditches. The area below 420 m elevation was flooded by the head pond after construction in early Fall 2020, and therefore that area did not require rip-rap. The area above 420 m elevation will be exposed prior to flooding to the final river/reservoir elevation of around 460 m elevation planned for 2024. Seeding with ESC mix completed on exposed soil areas after they were track packed and loosened.

Water quality sampling at LBDB provides data to apply to understanding of water discharge and flooding in subsequent phases of increased elevation of the Peace River and during water diversion through the Diversion Tunnels. Sample locations were established and first sampled on October 8, 2020, to characterize water quality in the LBDB area for ARD-ML monitoring. The purpose of sampling is to monitor PAG contact water from shale exposed during construction in March 2020, and that ultimately drains through the limestone lined ditches to the Peace River.

The initial sampling locations included two stations named “LBP Pond” and “LB Side Channel”. The LBP Pond sample location is small natural water holding depression at the top of the area and has been sampled regularly since initiation. The LB Side Channel was only sampled in 2020 prior to inundation of the Peace River and this station is now back flooded and no longer considered.

Additional sample locations were added in July 2021 following a review of the area during the Tetra Tech ARD/ML site audits. Water management structures and ditch linings were also amended. The water management structures were improved to manage flow and prevent erosion and ditches were lined with limestone to provide acid buffering capacity. These were proactive measures to manage signs of erosion and initial signs of ARD/ML generation on the exposed shale slopes.

Monitoring locations were added to the west and east armor ditch, which captures water from the shale slopes at upstream and downstream locations. These four stations are named as LBDB-WUS (west ditch upstream), LBDB-WDS, LBDB-EUS, and LBDB-EDS. Three stations were also added along the LBP Pond flow path. Station LBDB-LD-US captures water upstream of and draining into the LBP Pond. Station LBLD-LD-MS is downstream of LBP Pond, and station LDBD-LD-DS is further downstream prior to discharge to the Peace River.

Limited surface flow is observed in this area, and the only time that the sample stations in the LBDB area can be sampled, except for the LBP Pond location, is immediately following a significant rainfall event. Sample staff are instructed to sample these locations outside of regular monitoring events, if possible, when high rainfall is observed.

Activities in 2024

In 2024, sampling at LBP Pond occurred from March to July 2024 until the inundation from reservoir filling and flooding of this area removed this sample area from the sampling program. The LBDB area is now closed.

A representative photo of the LBDB locations is included in the Photographs section of the Appendix. Water quality lab data results are provided in Appendix Table B5 and discussed in Section 5.6. A map showing the locations is in Figure 3.

4.0 LOCAL CONDITIONS

4.1 Weather Conditions - Temperature and Precipitation

The minimum, maximum, and average daily temperature and the seven-day temperature range preceding each sampling event are summarized in the attached Table 2. The total precipitation measured for the seven days preceding each sample event and the precipitation on the day prior to and the day of the sample event are also summarized in Table 2. The temperature and precipitation data were sourced from BC Hydro's Site C Meteorological and Air Quality Station (attached Figure 4; BC Hydro, 2024), Station 7C Site C North Camp. A summary of mean daily temperature recorded on sampling events, and precipitation recorded prior to and during the sampling event is provided in Table 4-1.

Sampling events in 2024 were primarily conducted on dry days with little to no precipitation, except for moderate precipitation of 11.1 mm on April 28th, 2024, from 5:00 a.m. during the day of sampling.

Table 4-1: Sample Event Temperature and Precipitation

Routine Memo No.	Sample Event No.	Sample Event Date	Mean Daily Temperature	Precipitation on Sample Event	Precipitation for 7 Days Prior to Sample Event
			(°C)	(mm)	(mm)
-	1	21-Jan-24	-16.3	3.70	4.27
-	2	27-Feb-24	-22.7	0.19	8.24
1	3	19-Mar-24	-1.50	0.00	0.00
2	4	28-Apr-24	7.70	11.1	0.00
	5	26-May-24	14.1	0.00	3.05
3	6	26-Jun-24	16.0	0.00	41.8
	7	21-Jul-24	25.2	0.00	0.00
4	8	28-Aug-24	15.6	0.05	9.22
	9	25-Sep-24	11.6	0.00	16.8
	10	27-Oct-24	0.30	0.94	1.23
-	11	24-Nov-24	-17.8	0.00	11.5
-	12	19-Dec-24	-19.2	2.10	9.85

4.2 Classification of Seasonal Flows in Ditch

Residence time for water is low in the investigated area ditches due to their small catchment size. The climate data was used to evaluate water availability and potential water source for flows that were observed in the ditches.

The flows in ditches are susceptible to seasonal change and flow rate is highly influenced by local precipitation events, thus the classification of flow in ditches can assist to interpret the source and subsequent chemical fluctuations in water sampled (attached Table 3). For example, flows in ditches can be attributed to shallow or regional groundwater, spring freshet or surface run-off, dependant on the season and amount of precipitation recorded in the previous 24-hours and 7-days to the sampling event.

When significant or moderate precipitation has occurred in the previous 7-days, but minimal precipitation within the prior 24-hour period to the sampling event, the flows in ditches can result from shallow groundwater flow, mainly through unconsolidated overburden. The highest amount of precipitation in the preceding seven days of a sampling event with water quality samples occurred in June 2024 (41.8 mm), followed by September 2024 (16.8 mm) and November 2024 (11.5 mm). Precipitation data shows limited influence from precipitation and a much stronger correlation with freshet (Table 4). These values in the river are heavily influenced by the freshet and snowmelt during April, May, June as discussed below.

During spring freshet and snow melt, sampling events (e.g., April 28, May 26, June 26) can be classified as having a ‘dilution’ effect to the water chemistry, although increased TSS from turbid high flows can counteract this effect. To the contrary, during more arid seasons with little to no precipitation occurring in the previous 7-days and 24-hours, flows in ditches can be attributed to regional groundwater baseline seepage. In this event, when precipitation and sampling occur following dry periods, the surface chemistry of the rocks will be washed into the ditches and be concentrated.

There was significant rainfall prior to the June 26 event. The rainfall, along with potential freshet snowmelt, increased turbidity and flow in the ditches resulting in short-term effects on measurements such as TDS, TSS and potentially total metal concentrations from flushing of exposed slopes and ditch fill material.

As outlined in Section 2.3, regional bedrock groundwater in locations sampled are suspected to have elevated concentrations of dissolved sulphates due to groundwater interaction with local pyritic-shale bedrock and local bacteria, In previous sampling years from 2017 to 2023, it was observed that elevated sulphate may, to some degree, be related to dry periods following minimal precipitation during the previous 7-day and 24-hours to the sampling event. In 2024, outside of the moderate to high rainfall prior to the April, May and June sampling events, there did not appear to be elevated sulphate related to dry periods in the trend analysis. Sulphate and TDS commonly follow similar trends.

The classification of seasonal flows in ditches, therefore, are important to consider when interpreting fluctuations and exceedances in parameters measured in water quality guidelines over the period of one year.

4.3 Peace River Turbidity and TSS

During construction phase of the Site C dam, turbidity of the Peace River was monitored by BC Hydro through a series of continuous data loggers situated both upstream and downstream of the dam construction area. Time series data collected from the left and right banks of the Peace River up-gradient of the Moberly River (stations PAM-PBM and PAM-PBM, respectively) were provided to Tetra Tech by Ecofish to provide a general understanding of influence by precipitation on natural sediment within the Peace River upstream from the construction area surrounding sampling events. Peace River Above Moberly (PAM) or Below Moberly (PBM) reference relative to the Moberly River which is slightly upstream of the dam.

In 2024, the PAMs were decommissioned in preparation for reservoir filling and got replaced by two “background” stations just downstream of the tailrace (PBM left and right bank) where PBM = Peace Below Moberly downstream of the dam.

The turbidity data, measured in Nephelometric Turbidity Units (NTU), is converted to a value representing TSS, in mg/L, using a conversion factor developed by Ecofish using calibration of field measurements with laboratory data (Ecofish, 2025b).

The data considered by Tetra Tech include turbidity measurements for the seven days prior to the sampling event, the day of, during, and the day following the sampling event (Appendix Table 4). The daily mean turbidity and TSS measurements are elevated on June 26, 2024 following significant precipitation the previous seven days. Turbidity and TSS gradually increased from January to June 2024 then decrease the remainder of the year. A summary is in Appendix Table 4.

Table 4-2: Elevated Turbidity and TSS during Water Quality Sample Events in 2024

Sampling Date	Turbidity (NTU)	TSS (mg/L)
26-May-24	19.6	13.9
26-Jun-24	158.8	112.7

NTU: Nephelometric Turbidity Units

The highest reported 7-day precipitation to occur prior to a sampling event, recorded on June 26, 2024 (41.75 mm), is consistent with the spike in TSS and turbidity values. Figure 4-1 illustrates the variability and trends in turbidity and TSS during 2024 (Ecofish, 2025b) and can be reviewed in conjunction with the precipitation events listed in Appendix Table 2.

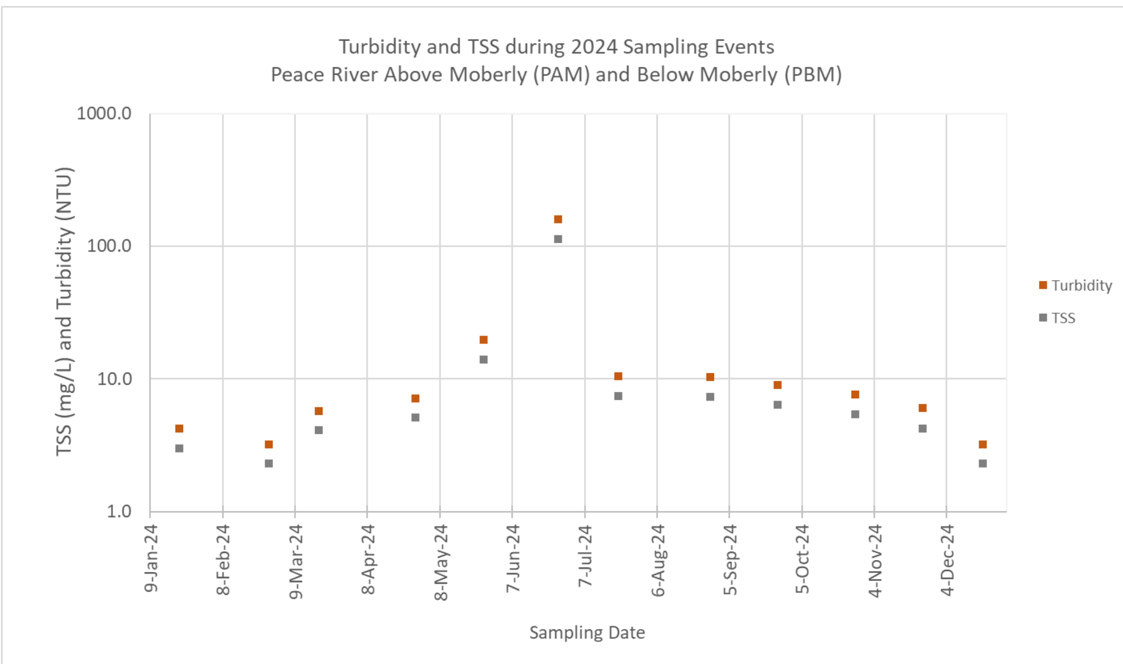

Figure 4-1: Turbidity and TSS during Water Quality Sample Events in 2024

5.0 WATER QUALITY MONITORING PROGRAM RESULTS

5.1 Sample Events in 2024

A summary of each water quality sampling event and corresponding analytical results are provided in the Routine Memos prepared by Tetra Tech and reported to BC Hydro between January to December 2024. Field reviews are completed monthly at the selected locations. Water quality sampling and in situ measurements are attempted monthly but are limited during some of the year by frozen or dry conditions.

The attached Table 1 presents a summary of the dates of the sampling events and which locations had in situ or lab testing completed.

Field notes document field observations monthly at each monitoring location and include estimated flow rate and water clarity, site conditions and construction activities. In situ tests are completed with measurements of water temperature, hardness, alkalinity, pH, and electrical conductivity using a hand-held meter. The in situ test data is presented in the Appendix Tables 6, 8, 10, 13 and 15, and summarized in the proceeding sections.

Laboratory results for all locations are provided in Appendix B (Tables B1 to B5). A summary of water quality results exceeding the BCAWQG water quality values, organized by monitoring location and month, are presented in Appendix Tables 7, 9, 11, 14 and 16. Rinse pH values for samples collected from the Area 21 Temporary PAG stockpile and R6 Slope are provided in Table 12.

5.2 Quality Control and Quality Assurance Program

5.2.1 Overview of QA/QC Program

The Quality Control and Quality Assurance (QA/QC) program is based first and foremost on experienced field staff familiar with the water quality monitoring program adhering to the British Columbia Field Sampling Manual, Part A and Part E (BC MoE, 2013) for sample collection procedures and QA/QC practises.

New sample containers were acquired from the laboratory prior to the sampling event and all handling of the containers, sampling devices and equipment during sample collection was completed wearing new nitrile gloves to minimize potential for contamination of the samples. A new disposable syringe and 0.45 µm filter are used for each sample being submitted for dissolved metals, as per field sampling procedures (BC MoE, 2013). A peristaltic pump and 0.45 µm high capacity inline filter is used when the water is too turbid for the manual syringe filtering, All samples were stored in a cooler filled with ice packs during the sampling.

The program incorporates the use of a Travel Blank (TB), Field Blank (FB) and replicate sample to test for potential contamination during sample collection, handling, or laboratory preparation, and to evaluate the precision of laboratory analysis. Travel Blanks were prepared by the laboratory and Field Blanks were prepared in the field at sample collection sites by field staff using the same source water as was used for the Travel Blank.

5.2.2 Laboratory QA/QC

Analytical results were received monthly from ALS Laboratories (ALS). The lab implements a detailed QC program into the sample analysis which includes a series of checks and evaluations for consistency in the sample analysis. The QC program includes method blanks, certified reference materials, laboratory control samples and duplicates. The QC Lot reported on Assay Certificates consistently met internal ALS Data Quality Objectives during the year.

5.2.3 Tetra Tech QA/QC

The analytical results of the QA samples (TB, FB, and replicate samples) were reviewed by Tetra Tech, and if potential contamination or concerns with analytical results were identified, they were discussed with the laboratory and/or the field sampler representatives, with reanalysis of samples completed for verification if necessary. The results of the field and travel blanks samples are provided in the Appendix Table 5a and results of the replicate samples in the QA program are presented in Appendix Table 5b.

5.2.3.1 Blank Samples

Travel Blanks were prepared by the laboratory and Field Blanks were prepared in the field at sample collection sites by field staff using the same sourced water. If the source distilled water was contaminated, similar elemental anomalies would be expected in both the TB and the FB. Blank samples were considered to 'fail' where any measured value was in concentrations above the reported detection limits for that parameter. Elemental concentrations measured above detection limit can be attributed to field contamination or calibration of analytical instrumentation. During 2024, TB and FB data showed minimal occurrences of any significant concentrations of values above the detection limit. As a result, no reruns were required by the lab during 2024.

Elemental concentrations measuring above the analytical detection limits in TB and FB samples occurred fifteen (15) times during the 2024 monitoring period, as detailed in the attached Table 5a. The above detection limit values were noted for acidity (10 samples), ammonia (1 sample), DOC (1 sample), total molybdenum (1 sample), dissolved aluminum (1 sample) and dissolved molybdenum (1 sample).

The pH for the TB and FB samples ranged from 5.51 to 5.62, with an average pH value of 5.57 from the 2024 sampling events. This pH range is typical for distilled water used for the TB and FB samples.

5.2.3.2 Replicate Samples

Replicate samples were evaluated using Relative Percent Difference (RPD). When an RPD value is less than 30% it is considered an acceptable threshold for variation of surface waters.

Field replicate samples with differences of elemental concentrations above the acceptable threshold of RPD > 30% had occurrences for a variable number of parameters measured during all ten sampling events in 2024, including: March 19 (2), April 28 (15), May 26 (2), June 26 (1), July 21 (3), August 28 (2) and September 25 (0), October 27 (5). Discrepancies are attributed to sediment disturbance during the collection of the first sample. The field staff were informed of these issues and were reminded of the importance of QC procedures during replicate sampling.

5.2.3.3 Total vs Dissolved Concentrations

Tetra Tech also reviewed the data for more general anomalies and inconsistencies. The total and dissolved concentrations for the full suite of elements were continued to be compared since there are frequent occurrences of dissolved concentrations exceeding total concentrations. The results were screened for analytical error, then assessed for expected natural variability of surface waters. Most instances were due to measurements at or near the analytical detection limit and could be explained by being within an acceptable range of error up to five times the lower detection limit for the respective element. In this case of reporting within five times of detection limit, the total concentrations are considered equal to the dissolved concentrations.

Dissolved concentrations exceeding total concentrations in samples were calculated within the acceptable threshold of an RPD < 30%, with exception of three occurrences in one sampling event, September 25, 2024, for aluminum, manganese, and zinc.

5.3 River Road Water Quality Monitoring

Dry, freezing and/or low or no flow conditions prevented consistent lab sampling and in situ measurements at the River Road monitoring locations in 2024. Field observations were documented each month.

Sufficient flowing water permitted samples to be collected during 2024 from the following stations, with the sampled months listed in parentheses:

- LBRR-EDP (March, in situ only; June, in situ and lab);
- LBRR-12+920 (April, May, June, July, August, September, October – in situ only);
- LBRR-DD (no samples) – discharge location to Peace River;
- RR8 (no samples) – discharge location to Peace River;
- RR9 (no samples) – discharge location to Peace River;
- LBRR-12+500 (no samples);
- LBRR-UC (no samples); and
- LBRR-LC (no samples).

A summary of water quality exceedances at River Road relative to BCAWQG-FST listed by monitoring location and month are listed in Table 7, and the screening results based on the laboratory data are tabulated in Appendix B, Table B1.

5.3.1 In Situ Measurements and Field Observations

Values for pH, conductivity, hardness, alkalinity, water temperature, estimated flow and turbidity measured at the River Road monitoring locations are included in Table 6. At River Road during 2024, the range in water temperatures was -0.1 to 18.4 °C. Measurements of pH ranged between 7.77 to 8.52, alkalinity ranged between 40 to 240 ppm, hardness of 800 ppm and conductivity between 1,712 to 3,170 µS/cm.

Flows within the River Road ditch are ephemeral. During 2024, seven stations were not sampled through the year due to insufficient flow for sampling. These stations include the three stations discharging to the Peace River (LBRR-DD, RR8, RR9) as well as LBRR-LC, LBRR-12+600, LBRR-12+700, and LBRR-12+810. Clear flow was noted at the upper chimney, LBRR-UC, with ice covering on March 19, 2024. Clear flow was noted at LBRR-12+920 during the six sampling events from May through October 2024, with leaf covering on October 27, 2024. Clear flow was noted at LBRR-EDP in March with light ice covering and in June with orange iron-stained sediment. Field observations noted clear flow commonly with water volumes too low for sampling resulting from dry or frozen conditions.

In the River Road catchment, the source of TSS is primarily attributed to River Road run-off, scouring of sediment deposited within the River Road ditch and washing from the cut-slopes.

5.3.2 Freshwater Short-Term Maximum Exceedances

The summary of exceedances is presented in Table 7 and summarized below. The complete data results from the samples are summarized in Appendix B, Table B1.

One (1) sample was collected from River Road during 2024 for laboratory analytical testing at LBRR-EDP. This sample reported a concentration of total iron of 3,430 ug/L, which is greater than the BCAWQG-FST value of 1,000 ug/L. The dissolved iron concentrations reports as less than detection limit (<10 ug/L) and well below the BCAWQ-FST value of 350 ug/L. These results are consistent with results in previous sampling years.

A neutral to alkaline laboratory pH value of 7.99 was measured. It is noted that the LBRR-EDP sample on June 26, 2024, measures other metal concentrations elevated above the BCAWQG-FLT (long-term) guidelines, including total aluminum, total cobalt, and chloride. The sulphate value of 750 mg/L exceeds the BCAWQG-FLT value.

At the three River Road locations discharging to the Peace River, there were no samples collected from LBRR-DD, RR9, and RR8 due to prevailing dry or frozen conditions preventing sufficient water volume to sample.

5.3.3 Trend Monitoring and Details of 2024 Sample Results

Data results from 2017 to 2024 at River Road monitoring stations have been compiled and plotted for trend analysis. Please refer to Figures 6 to 17 for time series charts. A single sample was collected from only one station at River Road in 2024, and therefore there are no trend analysis updates at River Road and we refer the reader to the 2023 annual report for discussion on trends from measured parameters from laboratory testing.

Water quality sampling has been inconsistent at the River Road locations since 2017 due to frequent low flow or frozen conditions. There is minimal data available from mid-2018 to the end of 2019, and 2024, and variable amounts of data in 2017 and 2021 to 2024 from different stations and times. The available data makes it challenging to discern seasonal trends at River Road.

Monthly water quality monitoring measures instantaneous ambient conditions at the time of sampling and as discussed in Section 3.1 the measurements are highly susceptible to temporal climate conditions due to the small catchment and short residence time of water within the River Road ditch. Event data characterizes the influences of seasonal conditions at the site.

The measured in situ pH values collected at River Road have remained within an acceptable BCAWQG-FST range (pH 6.5 to 9.0) during 2024 sampling events. This is consistent with previous years, except for some variability in pH during 2017 and 2018 when low pH values at select stations were observed prior to implementation of various mitigation and erosion control measures were implemented.

5.4 SBIAR Water Quality Monitoring

At SBIAR, sufficient flowing water permitted samples to be collected during 2024 from:

- RBSBIAR-US (no samples);
- RBSBIAR-DS (March to October);
- RBSBIAR-EUS (April, July to October);
- RBSBIAR-EDS (June).

In situ measurements were collected in the same months when sampling was possible. Field observations were documented each month and results for each monthly sampling event were plotted on time series charts for trend and qualitative correlation analysis.

A summary of water quality measurements exceeding the BCAWQ values at SBIAR listed by monitoring location and month are listed in Table 9. The complete set of screening results based on the laboratory data are tabulated in Appendix B, Table B2.

In late March 2024, ditch cleaning to remove ice in the SBIAR west ditch exposed fresh shale at the base of the ditch. This construction activity influenced some of the results as discussed below.

5.4.1 In Situ Measurements and Field Observations

Values for water temperature, pH, total alkalinity, and electrical conductivity measured at the SBIAR monitoring locations are included in Table 8. At the SBIAR locations during 2024, the range in water temperatures was -0.2 °C to 20.5 °C. Measurements of pH typically ranged between 7.53 to 8.32 (except two values of pH of 3.08 and 3.62 at the RBSBIAR-DS station, discussed below), alkalinity ranged between 0 to 240 ppm, hardness ranged between 0 to 800 ppm and conductivity between 817 to 4480 µS/cm. Flows in the SBIAR ditch system is variable throughout the year, with flows of approximately 0.05 to 1.0 L/s.

In the downstream west ditch at RBSBIAR-DS, yellow-tinged flow on top of ice was observed during the March 19 sampling event which followed ditch cleaning the previous month. At RBSBIAR-DS, orange-tinged staining in water was noted in the June, July, and September sampling events; and pH varied from a low pH of 3.59 and 3.08 in March and June, to a pH between 7.53 to 8.32 in the remaining six months of sampling at RBSBIAR-DS in 2024. The low pH during March and June was attributed to the fresh shale exposure in late March.

In the east ditch, the upstream RBSBIAR-EUS was noted with clear flows and vegetation were observed between the April to October sampling events, and the downstream RBSBIAR-EDS location was noted with orange-tinged staining in water flow in the June sampling event.

5.4.2 Freshwater Short-Term Maximum Exceedances

The summary of exceedances at RBSBIAR are presented in Table 9 and summarized below. The complete data results from the samples are summarized in Appendix B, Table B2.

Concentrations of total and dissolved iron, total cobalt, total manganese, dissolved cadmium, dissolved copper, dissolved zinc, and pH were measured as exceedances of the BCAWQG-FST in the RBSBIAR-DS location. No samples were collected from the RBSBIAR-US upstream location. No BCAWQG-FST exceedances were measured in the RBSBIAR-EUS and RBSBIAR-EDS locations from sampling in 2024.

In 2024, at the downstream SBIAR locations, total iron (5), dissolved iron (5), total manganese (2), total cobalt (2), dissolved cadmium (2), dissolved copper (1), dissolved zinc (5), and pH (2) were measured BCAWQG-FST exceedances at RBSBIAR-DS were measured in eight sampling events from March to October 2024; total aluminum (6) and total arsenic (2) measured BCAWQG-FST exceedances in the eight sampling events. Sediment washing and ditch cleaning can influence the SBIAR cut-slope. No BCAWQG-FST exceedances were measured at RBSBIAR-EDS in one sampling event in June 2024.

In 2024, at the upstream SBIAR locations, no parameters measured BCAWQG-FST exceedances at RBSBIAR-EUS in the five sampling events. No samples were collected from the RBSBIAR-US upstream location.

It is noted that the water flowing from the downstream locations do not have a direct downstream receptor; the water from the east ditch passes under the road via culvert to the downstream location in the west ditch where all water flows into a limestone armored spillway into a ditch which conveys to the RSEM R6 pond. Details of water flow and the intensive water quality monitoring program in RSEM R6 is referenced in Section 3.2 above.

5.4.3 Trend Monitoring and Details of 2024 Sample Results

Monthly water quality monitoring measures instantaneous ambient conditions at the time of sampling and, as discussed in Section 4, the measurements are highly susceptible to temporal climate conditions due to the small catchment and short residence time of water in the SBIAR ditch. Recurring trends at SBIAR over the monitoring periods sine 2017 may be preliminary indications of long-term trends and are discussed below and summarized in the attached Figures 18 to 32. In 2018 and 2019 a trend was observed for total metals showing a potential progressive increase in concentrations was occurring, although this appears to have been short-term and temporary and has not been observed in the subsequent monitoring years.

Alkalinity and pH values indicate that waters have remained alkaline from 2017 through 2024, with exception of March and June 2024, and March 2021. Since 2017, alkalinity measures more variability than pH values. In 2020 and 2021, an overall increase in alkalinity was noted between freshet in the spring towards the fall and winter months; and in 2024, alkalinity values show high variability at RBSBIAR-DS and more consistency at the other SBIAR locations. Acidity measures two sharp increases in March and June 2024 at RBSBIAR, and the other locations remain more consistent.

Typically, the SBIAR ditches measure variable TSS and TDS values attributable to the relatively small catchment and short residence time of waters that are subsequently sensitive to flux in surface water inputs from precipitation. In 2024, TDS values measure a sharp increase in March and June at the RBSBIAR-DS location, otherwise TDS values remain relatively constant at the SBIAR locations.

During 2024, sulphate measures within range of values collected since 2017, with exception of sulphate measured in March and June at RBSBIAR-DS. The RBSBIAR-DS location shows high variability and sharp increases in sulphate which measured the highest value in March and June 2024 than previous years. In previous years, a seasonal trend in sulphate concentration noted peaks in spring/early summer followed by an overall decrease during the year, although this trend is not apparent in 2024. From 2017 to 2024, an overall increasing trend in sulphate values is apparent.

Ammonia (NH_4 as N) is subject to a temperature and pH-dependent BCAWQG-FST and BCAWQG-FLT guideline. Although no exceedances are measured to the BCAWQG-FST, it is observed that ammonia values measure higher in the downstream SBIAR ditches (RBSBIAR-DS/-EDS) than the upstream ditches from 2017 to 2024.

Total and dissolved aluminum measure within range of values collected since 2017. The west downstream ditch measures sharp increases in total and dissolved aluminum values in March and June 2024 relative to previous years since 2017, and other SBIAR locations. The BCAWQG-FLT is applicable to total aluminum which exceeds the long-term guidelines in the majority of sampling events in 2024. At RBSBIAR-EUS, a decreasing trend in total aluminum is noted with lower values than previous years, and dissolved aluminum measures within range of previous years.

Total iron measures within range of values collected since 2017 and dissolved iron measures an increasing trend in 2024 relative to previous years. Total iron shows a more variable trend below and above the BCAWQG-FST guideline from 2017 to 2024, whereas dissolved iron previously remains below detection limit from 2016 to 2022, followed by occasional spikes in dissolved iron that reach the highest values in 2024 relative to previous years since 2017.

During 2024, the concentrations of metals, such as arsenic, cadmium, cobalt, copper, and zinc measure two sharp increases in March and June, otherwise remain within range of values in previous years from 2018 to 2024.

Monthly sampling in the SBIAR catchment occurred from 2017 to 2024 and will need to continue to be monitored going forward into 2025 for effective observations of trends. Permanent mitigation measures of the SBIAR ditches and slope will be carried out during the permanent road construction for Site C anticipated to be completed in 2026.

5.5 Powerhouse Area

Water quality sampling occurred at the BC Hydro L2 Powerhouse area from October 2020 to September 2023. The results of this sampling are presented in previous annual reports/

In 2024, due to progress of the dam construction the Powerhouse related area included two sampling locations named RBDT-Sump and Area 21 Sump.

A summary of in situ measurements are provided in Table 10 (RBDT), Table 12 (R6 Slope), and Table 13 (Area 21-Sump). A summary of water quality BCAWQG-FST exceedances are provided in Table 11 (RBDT) and Table 14 (Area 21-Sump). Screened lab data results are tabulated in Appendix B, Table B3 (RBDT) and Table B4 (Area 21-Sump). The results of rinse pH testing from the R6 slope are also presented in this report due to proximity between the Powerhouse and RBDT, however no water quality sampling was completed for this site.

Water from the Powerhouse area is conveyed to AFDE RSEM R6 pond as needed or water treatment facility that discharges to the sediment pond. Water from the AFDE RSEM R6 pond is monitored prior to discharge.

5.5.1 Field Observations and In Situ Measurements

5.5.1.1 Right Bank Drainage Tunnel

The summary of in situ field measurements at RBDT and RBDT-Sump are presented in Table 10 and summarized below.

In 2024, the RBDT and RBDT-Sump locations were sampled thirteen (13) times to characterize lab water quality from January to December. Coincident field observations and in situ measurements were completed nineteen (19) times at the RBDT and RBDT-Sump from January to December 2024.

At RBDT, in situ measurements collected from January to May 2024 recorded a range of pH 8.67 to 9.65 with mean pH value of 9.17, electrical conductivity 224 to 340 µs/cm, hardness 100 and 250 ppm, alkalinity 80 and 180 ppm, and water temperature 1.4 to 11.3 °C with clear flow and no estimation of flow rate.

At RBDT-Sump, in situ measurements collected from May to December 2024 recorded a range of pH 8.75 to 10.44 with mean pH value of 9.95, electrical conductivity 307 to 2160 µs/cm, hardness 0 to 100 ppm, alkalinity 180 and 240 ppm, and water temperature 8.2 to 14.6 °C with clear flow and no estimation of flow rate.

5.5.1.2 R6 Slope

In 2024, excavated material from the R6 slope adjacent to the dam was transported and stockpiled to the Area 21 Temporary PAG disposal area.

The summary of rinse pH field measurements of R6 Slope material are presented in Table 12 and summarized below. On May 26, 2024, six rinse pH tests from R6 Slope shale rock samples measured an average 3.46 pH value.

On October 2, 2024, five rinse pH tests from shale rock samples stockpiled in Area 21 Temporary PAG stockpile area measured a range from pH 3.67 to 6.76 with mean pH value of 5.42, electrical conductivity 2.55 to 1,434 µs/cm, TDS 1.00 ppt to 818 ppm, and temperature 17.7 to 20.0 °C.

5.5.2 Freshwater Short-Term Maximum Exceedance

5.5.2.1 Right Bank Drainage Tunnel

The summary of exceedances at RBDT and RBDT-Sump are presented in Table 11 and summarized below. The complete data results from the samples are summarized in Appendix B, Table B3.

In the thirteen (13) sampling events during 2024 at the RBDT location, there was a total ten (10) BCAWQG-FST (freshwater short-term) guideline exceedances measured, including for pH > 9.0 (5), ammonia (1), and total iron (4). Parameters measured above the BCAWQG-FLT (freshwater long-term) guideline for total aluminum (12), total arsenic (5), total silver (2), dissolved copper (5), chloride (5), ammonia (5), and nitrite (1) were noted.

At RBDT, the pH measures consistently alkaline and exceeded the upper limit of pH > 9.0 from the BCAWQG-FST guideline (pH 6.5-9.0) during five of the total twelve months. The pH values measured within the guidelines from January to July 2024, followed by a pH range >9.0 exceeding the guidelines from August to December 2024. Four BCAWQG-FST exceedances were measured for total iron in March, April, May and July 2024. One BCAWQG-FST exceedance was measured for ammonia on September 25 (777 µg/L), and other months ranged from 26.8 to 438 µg/L.

At RBDT, from the total twelve sampling events, total aluminum (9) consistently measured above the BCAWQG-FLT guideline and ranged from 434 to 1,600 µg/L. Total arsenic, dissolved copper, and chloride measure BCAWQG-FLT exceedances between August to December 2024, which were not measured previously from May to July 2024. Ammonia measures BCAWQG-FLT exceedances in four of the five months between August to December. During these five months from August to December, there shows a possible trend in elevated values for these parameters. BCAWQG-FLT (long-term freshwater) guidelines do not fall under the CEMP and therefore noted for reference.

A summary water quality results from RBDT are provided in Table 11.

5.5.2.2 R6 Slope

Rinse pH values were tested during 2024 on the shale rock material sourced from the R6 slope, which was transferred and stockpiled in the Area 21 Temporary PAG stockpile area. A summary of rinse pH values from R6 Slope are provided in Table 12.

On May 26, 2024, BC Hydro personnel completed six rinse pH tests with shale material from the R6 Slope. The rinse pH values range from 3.22 to 3.64, with an average rinse pH of 3.46.

During the October 2, 2024 site audit, Tetra Tech personnel completed five rinse pH tests on shale material sourced from R6 Slope that was stockpiled at Area 21 Temp PAG Stockpile. The rinse pH values range from 3.67 to 6.76, with an average rinse pH of 5.42. Four rinse pH values measure below the acceptable BCAWQG-FST guidelines (pH 6.5-9.0), and one rinse pH value measures slightly within the acceptable guidelines.

5.5.3 Trend Monitoring and Details of 2024 Sample Results

Water quality sampling in the Powerhouse Area at the RBDT and Area 21-Sump are recent sampling locations. No trend charts are prepared for the water quality results from these locations for this year.

At the RBDT, a relatively consistent trend is observed to measure elevated highly alkaline pH values, and consistently elevated ammonia, aluminum, arsenic, copper, and chloride. Total iron, dissolved zinc and nitrite were elevated above the BCAWQG-FST or BCAWQG-FLT on one occasion therefore not a consistent trend. The May and July water quality sampling measure less occurrences of guideline exceedances relative to the period from August to December 2024.

At the Area 21-Sump, no parameters were measured to exceed the BCAWQG-FST guidelines from the seven (7) water quality sampling events.

5.6 Area 21 Temporary PAG Stockpile Sump

5.6.1 Field Observations and In Situ

The summary of in situ field measurements at Area 21-Sump are presented in Table 13 and summarized below. As noted in Section 3.4, the source of material and the volume of material contained in the Area 21 stockpile varied throughout the year and therefore results of analysis throughout the year are subject to these changes.

In 2024, the Area 21-Sump was sampled four (4) times to characterize lab water quality from July through October. Field observations and in situ measurements were completed twelve (12) times at the Area 21-Sump from April to October 2024. No sampling was conducted in January, February, November, and December 2024 due to frozen and no flow conditions.

In situ measurements collected from April to October at Area 21-Sump recorded a range of pH 7.63 to 8.37 with mean pH value of 8.15, electrical conductivity 519 to 1124 µs/cm, hardness 250 and 450 ppm, alkalinity 40 and 80 ppm, and water temperature 1.7 to 20.6 °C with clear to mostly clear flow and no estimate of flow rate.

During the April 29-May 1, 2024 site audit, Tetra Tech personnel completed ten (10) rinse pH tests on shale material from the Area 21 Temp PAG Stockpile. The rinse pH values ranged from 2.63 to 8.61, with an average rinse pH of 6.77.

5.6.2 Freshwater Short-Term Maximum Exceedances

The summary of exceedances at Area 21-Sump are presented in Table 14 and summarized below. The complete data results from the samples are summarized in Appendix B, Table B4.

In the seven (7) sampling events at the Area 21-Sump location from April to October 2024 there were no BCAWQG-FST exceedances measured.

At Area 21-Sump, the pH measures consistently neutral to alkaline with a range of pH 7.71 to 8.05, and average pH 7.92.

At Area 21-Sump, total selenium (3.72 to 6.22 µg/L) and dissolved selenium (3.83 to 6.02 µg/L) consistently measured above the BCAWQG-FLT guideline (2.0 µg/L) in all seven sampling events in 2024. Sulphate measures slightly above the BCAWQG-FLT guideline in one of the seven samples.

A summary water quality results from Area 21-Sump are provided in Table 14.

5.7 BC Hydro Left Bank Debris Boom

Water quality sampling commenced at the BC Hydro LBDB area in October 2020 and continued sampling through the 2024 monitoring period. The LBP Pond was sampled five times from March to July 2024 before the area was inundated from the Peace River. The remainder of LBDB sampling locations were observed with frozen or no flow conditions and not sampled in 2024. The sample locations are summarized on Figure 3.

A summary of water quality exceedances at LBDB relative to BCAWQG freshwater guidelines listed by monitoring location and month are listed in Table 16, and the screening results based on the laboratory data are tabulated in Appendix B, Table B5.

5.7.1 Field Observations and In Situ Measurements

The summary of in situ field measurements at Area 21-Sump are presented in Table 15 and summarized below. In 2024, in situ measurements were collected from LBP Pond from March to July 2024.

At the LBP Pond, a range of in situ measurements were collected for pH (7.27 to 7.85), electrical conductivity (329 to 3,550 μs/cm), hardness (250 and 800 ppm), alkalinity (40 to 240 ppm), and water temperature (1.90 to 21.9 °C). The LBP Pond was observed with clear to slight turbidity and no flow conditions with no flow in or out of the pond.

5.7.2 Freshwater Short-Term Maximum Exceedances

The summary of exceedances at LBDB are presented in Table 16 and summarized below. The complete data results from the samples are summarized in Appendix B, Table B5.

In 2024, during the five sample events from March to July 2024 at LBP Pond, a total of three BCAWQG-FST exceedances were measured including total iron (2) and dissolved zinc (1). The LBP Pond is not a discharge station and most commonly no flow is observed in or out of the pond.

The LBDB sampling program including the LBP Pond were discontinued following the July 2024 sample event due to inundation of the area and accessibility.

5.7.3 Trend Monitoring and Details of 2024 Sample Results

Sampling at BC Hydro's LBDB area has primarily been limited to sampling at the LBP Pond location, therefore comment on trend observations are limited. Trend charts are provided in Figures 35 to 44.

At LBP Pond, pH values have remained neutral to alkaline with pH values at or above 7.92. Total alkalinity values vary with an overall increasing trend through the year, which is a similar trend noted in previous years. Acidity values vary from below detection limit <2 mg/L to 7.9 mg/L in 2024, which is within range of previous years. Sulphate values show a gradual increasing trend through the year, and measures above the BCAWQG-FLT guideline from April onwards. TDS values follow a similar to sulphate with an overall increasing trend through the year, which differs from a variable and overall decreasing trend in TSS values.

Total and dissolved iron concentrations follow similar trends in 2024 relative to previous years. At LBP Pond, total iron exceeds the BCAWQG-FST guideline in March and April followed by decreasing values below the guideline. Dissolved iron measures well below the BCAWQG-FST guidelines. Dissolved zinc concentration is variable and measures above the BCAWQG-FST guideline in the June 2024 sampling event.

6.0 CONCLUSIONS AND RECOMMENDATIONS

A water quality monitoring program was implemented on behalf of BC Hydro to monitor the water quality at PAG exposure locations from River Road, South Bank Initial Access Road, BC Hydro Left Bank Debris Boom, and the Powerhouse Area (L2 Powerhouse, Right Bank Drainage Tunnel) and at a temporary PAG storage area in Area 21. Initial sampling areas and locations were selected to maintain a continuous monitoring record commensurate with previous sampling completed in 2016 by Lorax on behalf of PRHP (where applicable). The water quality program has been ongoing since 2017, with new sample locations added and removed as the site construction and activities have changed. Water chemistry is monitored to identify influence of ARD-ML processes on water quality from construction related exposed PAG shale.

The water quality program is conducted in accordance with the CEMP, Rev. 12 Appendix E (Rev 6.1) Acid Rock Drainage and Metal Leachate Management Plan, Section 5.2.1.7 (BC Hydro, 2023). The program includes monthly review of the sample locations and observations on water flow, signs of ARD/ML, and changes resulting from construction or other site activities. In situ measurements and sample collection is attempted at all locations, however is limited at various times due to frozen or no flow conditions.

The sampled locations are generally ephemeral. Residence time for water is low in the investigated area ditches due to their small catchment size. The flows in ditches are susceptible to seasonal change and flow rate is highly influenced by local precipitation events, thus the classification of flow in ditches can assist to interpret the source and subsequent chemical fluctuations in water sampled. For example, flows in ditches can be attributed to shallow or regional groundwater, spring freshet or surface run-off, dependent on the season and amount of precipitation recorded before and during the sampling event. Monthly water quality monitoring measures instantaneous water quality and may not be reflective of long-term baseline conditions.

The water quality program is achieving the purpose of evaluating water quality from dam site areas where construction related PAG exposures and PAG contact surface water is identified. The results of the program demonstrate that ARD/ML processes are occurring, however the management and mitigation measures implemented are working and that water quality remains primarily neutral to alkaline with metal concentrations dominantly below the established water quality criteria. The water quality monitoring program provides a framework for identifying water quality concerns from the exposed rock cuts in a timely manner and implementing the required mitigation measures.

The results of the water quality program are used as the basis of evaluating the needs of long-term mitigation of the sites. Construction of a cover system on the shale cut-slope at River Road was commenced in 2024 and will continue in 2025. A cover system is also being finalized for SBIAR that will be implemented as part of the permanent dam site roads construction. Locations upstream of the dam have been inundated by the reservoir.

6.1 River Road Water Quality Monitoring

Water quality laboratory data was collected from one location, LBRR-EDP, during 2024. The other RR sample locations were dry or frozen with no flow conditions. A total of ten (10) in situ measurements were collected in 2024 from three sampling locations including LBRR-US (1), LBRR-12+900 (7), and LBRR-EDP (2) in 2024.

During the sampling events in 2024, discharge from River Road to the Peace River was not noted at the discharge stations, LBRR-DD, RR8, and RR9. It is recommended that in situ water quality measurements are collected from any discharge observed from culvert RR8 and/or RR9 during high flow events even if outside of regular sampling events. In situ field measurements of pH within the River Road ditch indicated a neutral to alkaline pH throughout the 2024 sampling year. In the one water quality sample collected from LBRR-EDP in June 2024, one

BCAWQG-FST exceedance was measured for total iron. In former years with more samples, the exceedances are primarily attributed to washing, or flushing, of sediment and secondary mineral precipitate during freshet (or precipitation following a dry period), as water contacted accumulated sediment within the ditch in addition to the exposed shale, colluvium, and overburden cut-banks.

A cover system for the cut-bank on the north side of River Road between the upper chimney and lower chimney ditches was designed to mitigate the acid generating exposure on the slope in the long-term. The extents of the cover system was supported by field rinse pH tests to define areas of active acid generation, and to confirm depth of scraping on the slope prior to cover placement. Construction of the slope cover between approximately 12+730 and 12+900 commenced in November of 2024, and includes scraping of the top layer of weathered and actively acid generating shale, to reach shale with a circa-neutral pH, and partial placement of geotextile, and impermeable geomembrane.

In addition, a cover design for the cut-off ditch up-gradient of River Road was designed, including scraping of the ditch to remove active acid generating material, application of ag-lime in areas where scraping was not feasible and placement of a bentonite liner in the base of the ditch to prevent further oxidation of PAG materials. In 2024 the access to the ditch for construction was established and the ditch was cleaned out and graded to its final geometry.

The cover of the upper River Road slope and cut-off ditch was completed in February 2025. Detailed design of a similar cover for the shale slope adjacent to the lower chimney ditch will be completed in 2025.

Recommendations for River Road

As per CEMP Appendix E Section 5.2.1.7, it is recommended that water quality monitoring is continued on a monthly basis within the River Road catchment at the downstream stations. Continuous monthly monitoring will evaluate the effectiveness of ARD-ML permanent management covers. There may be opportunities to reduce in situ sampling analysis at the upstream locations given the consistency of in situ measurements over time. The sampling locations and frequency of monitoring will be reviewed with BC Hydro for the 2025 sampling year.

6.2 SBIAR Water Quality Monitoring

Water quality data was collected from three of the four established sampling locations in 2024 that measure water directly from within the SBIAR ditch locations. The ditch samples provide long-term characterization of SBIAR water management and water quality originating from the SBIAR PAG slope at the upstream and downstream location in the east and west ditches.

Water flowing through the SBIAR ditch has no direct downstream receptor, and all water in the east and west ditches is conveyed directly to the PRHP RSEM R6 pond which is an approved PAG contact water management facility. Downstream water quality is monitored by PRHP within the PRHP RSEM R6 pond for management prior to discharge into the Peace River.

Evidence of active ARD-ML processes are observed on the shale slopes in SBIAR through observation of secondary iron hydroxide mineral formation. During 2024, the pH values in the SBIAR west ditch shows high variability from acidic to alkaline as a result of construction exposure of fresh shale in the base of the ditch in March 2024.

Recommendations for SBIAR Water Quality Monitoring

The collection of up-gradient and down-gradient water samples from both the western and eastern SBIAR ditch is suggested to continue through 2025 for comparative purposes. The RBSBIAR-US was discontinued in 2024 due to changes in access to the upstream west ditch which may likely continue in 2025, but to sample when possible. Construction of permanent site roads including SBIAR, which will include permanent mitigation measures for mitigation of PAG slopes, and water quality monitoring programs may be modified in consideration of the permanent road configuration and covers.

Downstream water is collected within the PRHP RSEM R6 pond for management prior to discharge into the Peace River. As per CEMP Appendix E, Section 5.2.1.7, since there is low to moderate risk of negative downstream effects on water quality, monitoring of water quality within SBIAR is recommended to be continued on a monthly basis in 2025. It is recommended that BC Hydro implement a long-term solution for the Site C operations phase for the exposed shale slope due to potential for ongoing ARD/ML processes.

6.3 Powerhouse Area Water Quality Monitoring

In 2024, dam construction was completed followed by the inundation of the Peace River and power generation commenced. The Powerhouse Area in proximity to the dam was monitored at the Right bank Drainage Tunnel and R6 Slope sampling to monitor trends in water quality in the area in addition to rinse pH related to stockpiled PAG material from this area. Previous sampling was completed in the L2 Powerhouse area and is included in previous years reporting.

Right Bank Drainage Tunnel

The RBDT sample location varies from a valve at the front entrance of the tunnel to a sump located in the tunnel. The RBDT-Sump is located where the RBDT Access intersects the main tunnel, and is approximately 685m from the RBDT tunnel entrance sample location.

During 2024, in situ measurements for twelve months from the RBDT entrance (January to May) and RBDT-Sump (May to December) consistently measured highly alkaline pH values. Water quality sampling for nine months from May to December 2024 resulted in BCAWQG-FST exceedances in alkaline to highly alkaline pH (5), ammonia (1), total iron (2).

The parameters measuring values elevated above the BCAWQG-FLT guideline for ammonia (4), chlorite (5), total aluminum (9), total arsenic (5), dissolved copper (5), and dissolved zinc (1).

The source of the consistent elevated ammonia, aluminum and highly alkaline pH is thought to be from water contact with construction and admixtures of concrete cement contact water in the tunnel (Bai et al., 2005). Previously, during dam construction, water sampling at the L2 Powerhouse in the area as well as the adjacent area for the AFDE foundation enhancement trial drilling program, both contained an excess of dissolved aluminum. This was previously investigated and determined that the most likely source of the dissolved aluminum was originating from the RCC concrete which contains fly-ash (21.2% aluminum oxide) and General use (GU) cement (5% aluminum oxide).

R6 Slope

The R6 shale slope is located adjacent to the Powerhouse to the east of the powerhouse structure and to the west of the RBDT portal. In August 2024, construction on the R6 slope was initiated for geotechnical purposes. The construction included foundation preparation to remove weathered shale bedrock from the existing slope such that a Zone 3 material cover could be placed against unweathered and geotechnically sound bedrock. The existing slope was progressively benched in 10m sections, with each section backfilled with Zone 3b before the next is excavated. The Zone 3b material is covered with a Zone 5 limestone rip-rap. Water from the slope is captured in the limestone lined spillway drainage channel.

The excavated material from the R6 slope during construction was transported and stockpiled to the Area 21 Temporary PAG disposal area. Rinse pH tests conducted on the shale material from R6 slope prior to construction, indicate acidic pH on May 26, 2024 (6 samples), May 1, 2024 (10 samples), and October 2, 2024 (5 samples). The material was moved to the Area 21 temporary stockpile where water quality monitoring is conducted.

Recommendations for Powerhouse Area Water Quality Monitoring

Water quality testing is recommended to continue from the RBDT to monitor dam contact water for trends in pH, ammonia, and aluminum. The remaining locations are not accessible with the reservoir flooded and Powerhouse in operation. Field staff are encouraged to maintain a consistent single sample location as often as possible at RBDT and to distinctly name water quality samples as either RBDT (tunnel entrance) or RBDT-Sump (further into tunnel). Tracking contribution of dam construction material to water quality in addition to monitoring association of elevated metals or pH that may be related to ARD-ML processes.

The R6 slope area construction is complete. The area should be reviewed by BC Hydro field staff for visual signs of ARD/ML. Water from the R6 slope is captured in the limestone lined spillway drainage channel which discharges to the Peace River. The limestone provides neutralization potential to reduce potential for acidic drainage to drain from the area. The water quality from this project area is monitored as part of the overall receiving water monitoring program, specifically at the nearby R6 RSEM upstream location. If issues are observed, the R6 slope area should be investigated to evaluate if it's a possible source of the issue.

6.4 Area 21 Temporary Stockpile Area

An engineered, temporary stockpile was constructed in 2024 in the Area 21 laydown area to hold PAG material prior to ultimate disposal in an approved location. Rinse pH tests were conducted on the stockpiled material in April and October of 2024 to evaluate progression of acid generation in the stockpile and inform decision making on relocation of the material. Rinse pH analysis during 2024 indicated that the temporary stockpile contained some acid generating material at various times.

The temporary stockpile source material, as well as the volume of material in the pile fluctuated during the 2024 year. The construction of the Area 21 temporary stockpile pad location was completed at the end of 2023 for the purpose of holding PAG material from the Approach Channel excavations. The approach channel material was moved to the RSEM L5 Garbage Creek area for permanent disposal in prior to reservoir flooding. Following the removal of the approach channel material from the temporary stockpile, material from the R6 slope excavation was placed in the stockpile in late summer 2024.

A new sampling station named Area 21-Sump was established in January 2024. The sample station receives run-off from the Area 21 Temporary PAG stockpile area.

During 2024, the seven water quality sampling events from April to October 2024 did not result in any BCAWQG-FST exceedances. At Area 21-Sump, the pH measurements were consistently neutral to alkaline with a range of pH 7.71 to 8.05, and average pH 7.92.

Total selenium (3.72 to 6.22 µg/L) and dissolved selenium (3.83 to 6.02 µg/L) consistently measured above the BCAWQG-FLT guideline (2.0 µg/L) in all seven sampling events in 2024. Sulphate measures slightly above the BCAWQG-FLT guideline in one of the seven samples.

Recommendations for Area 21 Water Quality Monitoring

Water quality testing is recommended to continue at the Area 21-Sump location on a monthly basis until the temporary stockpile is completely removed and/or covered by an engineered suitable cover for mitigation of PAG materials.

6.5 BC Hydro Left Bank Debris Boom Monitoring

Sampling at BC Hydro's LBDB area commenced in 2020 and initially included sampling at LBP Pond and a Peace River side channel location. Additional sample locations were added in July 2021 following a review of the area to monitor construction contact water. The added monitoring locations were located in the armor ditches at the toe of the exposed construction PAG faces and laydown drainages downstream of the LBP Pond. All locations were monitored until July 21, 2024, after which accessibility was no longer possible due to inundation of the Site C reservoir filling the area.

During 2024, the LBP Pond location was sampled a total of five months from March to July 2024, and the other LBDB sampling locations remained with dry or frozen no flow conditions. Water is not commonly observed to discharge from the LBP Pond, but if it does it passes through a limestone lined water management ditch system which was not observed in 2024. Field samplers confirmed that there was no direct discharge to the Peace River.

At LBP Pond sample station, in situ measurements from March to July indicate neutral pH values with an average 7.50 pH and clear to slightly turbid water with no flow in or out of the pond. Water quality sampling during the same five months resulted in BCAWQG-FST exceedances for total iron (2) and dissolved zinc (1).

Recommendations for BC Hydro Left bank Debris Boom

The LBDB area is inundated and monitoring discontinued following July 2024. The shale exposure is now sub-aqueous and ARD-ML reactions are mitigated.

7.0 CLOSURE

We trust this document meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

PROFESSIONAL GEOSCIENTIST
PROVINCE OF BRITISH COLUMBIA
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2025-03-28

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EM/SK/tak

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

PERMIT NUMBER: 1001972

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FIGURES

BC Hydro Left Bank Debris Boom (Fig 35-44)

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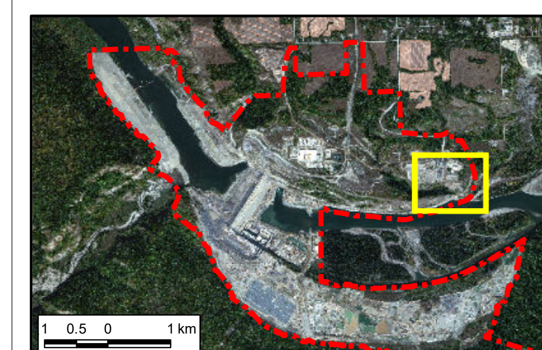
LEGEND

- Water Sample (Insitu Testing Only)
- Water Sample (Insitu Testing & External Lab Testing)
- Discharge Location
- Culvert
- Ditch
- Ditch Diversion
- Howe Pit
- Blind Corner Outcrop
- Site C Project Boundary

Sample ID	Easting	Northing
LBRR-RR8	632262	6229624
LBRR-RR9	632460	6229680
LBRR-EDP	632715	6229832
LBRR-DD	632853	6229862
LBRR-LC	632856	6229899
LBRR-12+500	632914	6229921
LBRR-12+600	632948	6229983
LBRR-12+700	632992	6230078
LBRR-12+810	633039	6230195
LBRR-12+920	633000	6230282
LBRR-UC	633018	6230253



NOTES
Base data source:
Imagery provided by BC Hydro (Oct 2024/Sept 2023).

STATUS
ISSUED FOR USE

SITE C WATER QUALITY MONITORING 2024 ANNUAL REPORT

Left Bank - River Road

PROJECTION: UTM Zone 10
DATUM: NAD83
CLIENT: BC Hydro Power smart

Scale: 1:3,500
50 25 0 50
Metres

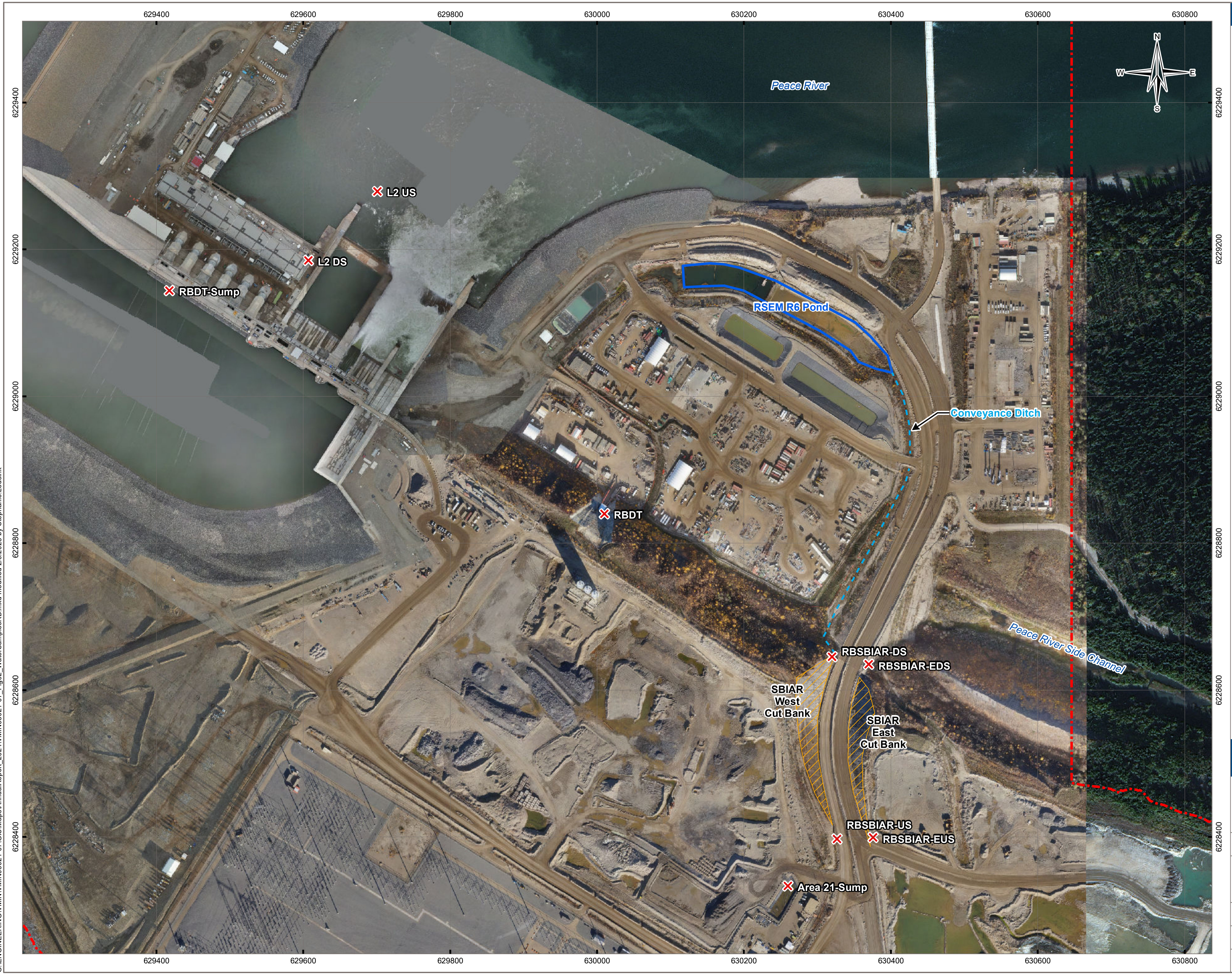
TETRA TECH

FILE NO.: VMIN03021-07_Fig01_WaterSamplesLBRR.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	EM	0

DATE: March 2025
PROJECT NO.: ENG.VMIN03021-07

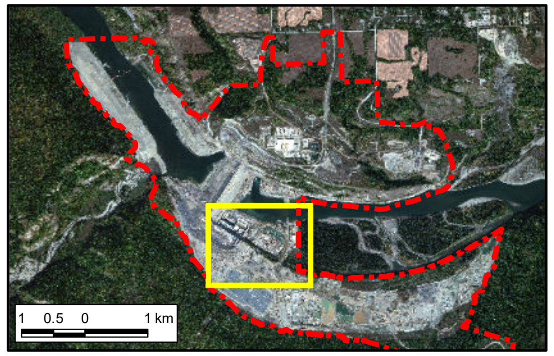
Figure 1



LEGEND

- Water Sample (Insitu Testing & External Lab Testing)
- Ditch
- Cut Bank
- RSEM R6 Pond
- Site C Project Boundary

Sample ID	Easting	Northing
RBSBIAR-US	630327	6228397
RBSBIAR-EUS	630376	6228399
RBSBIAR-DS	630320	6228645
RBSBIAR-EDS	630370	6228635
Area 21-Sump	630260	6228333
RBDT	630010	6228840
RBDT-Sump	629418	6229144
L2 US	629701	6229279
L2 DS	629607	6229185



NOTES
Base data source:
Imagery provided by BC Hydro (Oct 2024/Sept 2023).

STATUS
ISSUED FOR USE

SITE C WATER QUALITY MONITORING 2024 ANNUAL REPORT

Right Bank - SBIAR and L2 Powerhouse

PROJECTION: UTM Zone 10
DATUM: NAD83
CLIENT: BC Hydro Power smart

Scale: 1:5,000
100 50 0 100
Metres

TETRA TECH

FILE NO.: VMIN03021-07_Fig02_WaterSamplesRB.mxd

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	EM	0

DATE: March 2025
PROJECT NO.: ENG.VMIN03021-07

Figure 2

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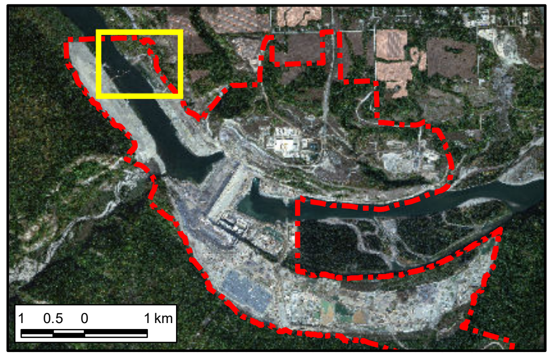
LEGEND

- ✕ Water Sample (Insitu Testing & External Lab Testing)
- ● Discharge Location
- Site C Project Boundary

Sampe ID	Easting	Northing
LBDB-EDS	627994	6231856
LBDB-EUS	628202	6231908
LBDB-LD-DS	628093	6231766
LBDB-LD-MS	628147	6231844
LBDB-LD-US	628257	6231876
LBDB-WDS	627969	6231883
LBDB-WUS	628189	6231933
LBP-Pond	628227	6231885
LBDB Side Channel E	628311	6231511



NOTES
Base data source:
Imagery provided by BC Hydro (Sept 2023).

STATUS
ISSUED FOR USE

SITE C WATER QUALITY MONITORING 2024 ANNUAL REPORT

Left Bank Debris Boom (LBDB)

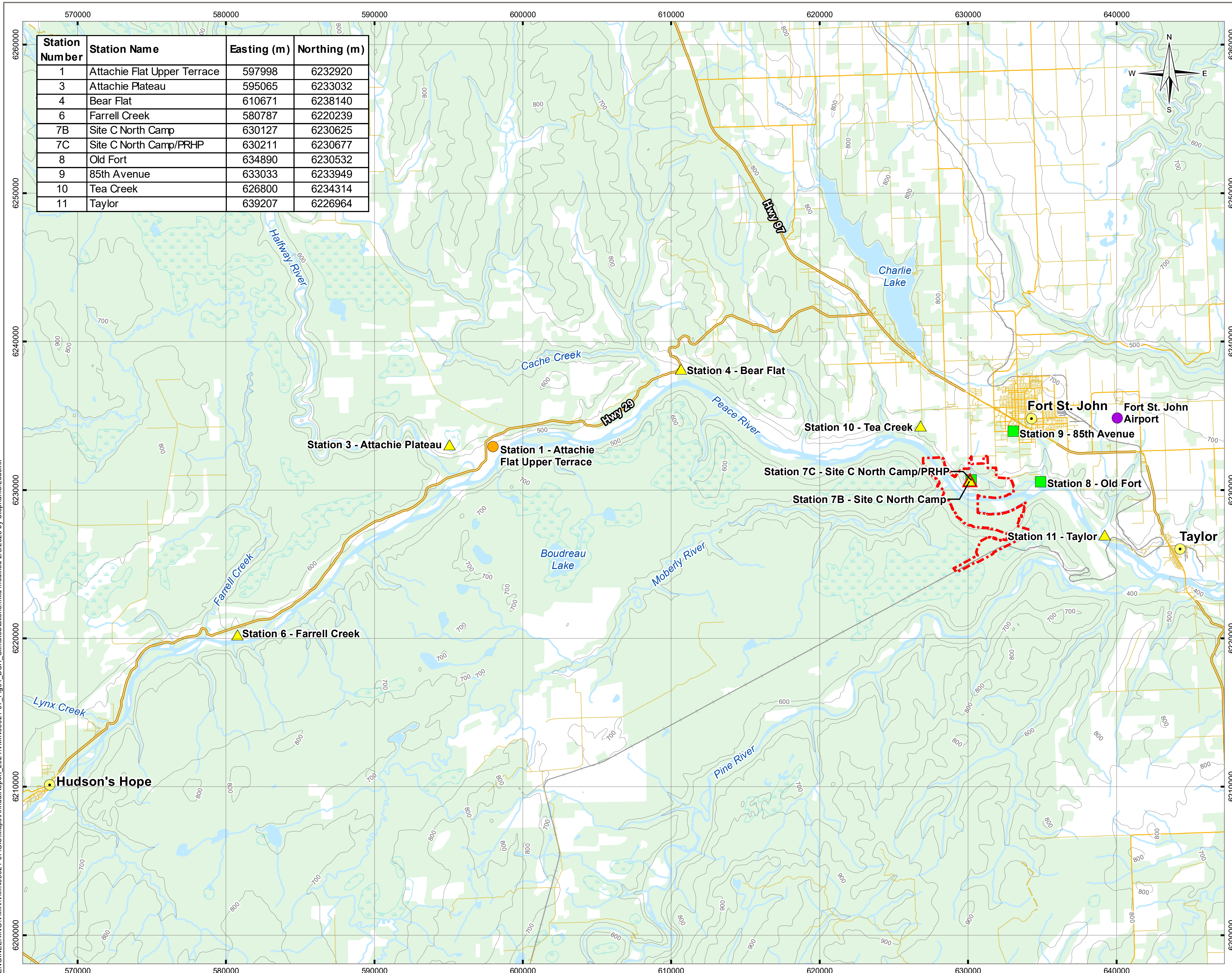
PROJECTION	DATUM	CLIENT
UTM Zone 10	NAD83	BC Hydro Power smart

Scale: 1:4,000
80 40 0 80
Metres

TETRA TECH

FILE NO.				
VMIN03021-07_Fig03_WaterSamplesLBDB.mxd				
OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	BB	EM	0
DATE	PROJECT NO.			
March 2025	ENG.VMIN03021-07			

Figure 3



Station Number	Station Name	Easting (m)	Northing (m)
1	Attachie Flat Upper Terrace	597998	6232920
3	Attachie Plateau	595065	6233032
4	Bear Flat	610671	6238140
6	Farrell Creek	580787	6220239
7B	Site C North Camp	630127	6230625
7C	Site C North Camp/PRHP	630211	6230677
8	Old Fort	634890	6230532
9	85th Avenue	633033	6233949
10	Tea Creek	626800	6234314
11	Taylor	639207	6226964

LEGEND

Site C Project Boundary

Station Type

- Meteorological Only - used for Temperature and Precipitation data
- Meteorological Only
- Air Quality Only
- Meteorological and Air Quality
- Environment Canada Meteorological Station

Base Features

- City/District Municipality
- Highway
- Main Road
- Local Road
- Resource/Recreational Road
- Railway
- Residential Area
- Contour (100 m)
- Watercourse
- Waterbody
- Wetland
- Wooded Area

NOTES
Station locations provided by BC Hydro and RWDI (September 2017).
Base data source: CanVec 1:250,000.

STATUS
ISSUED FOR USE

SITE C WATER QUALITY MONITORING 2024 ANNUAL REPORT

Site C Meteorological and Air Quality Stations

PROJECTION: UTM Zone 10
DATUM: NAD83
CLIENT: BC Hydro Power smart

Scale: 1:250,000
5 2.5 0 5
Kilometres

FILE NO.: VMIN03021-07_Fig04_BCH_ClimateStations.mxd

TETRA TECH

OFFICE	DWN	CKD	APVD	REV
Tt-VANC	SL	YL	EM	0

DATE: March 2025
PROJECT NO.: ENG.VMIN03021-07

Figure 4

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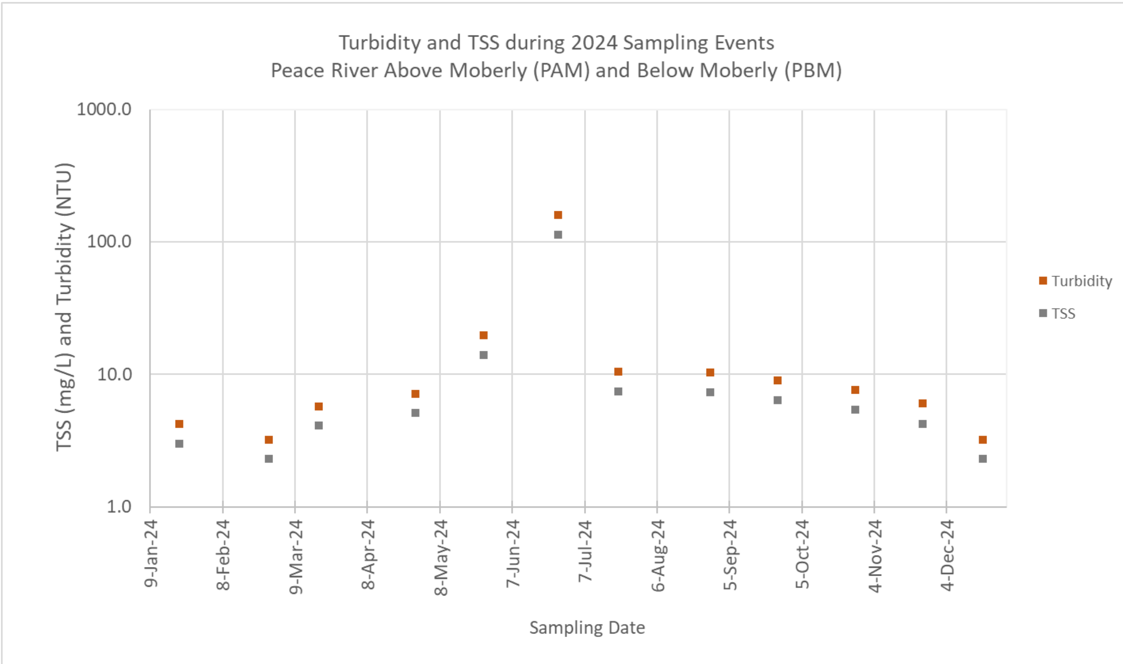
Figure 5: Turbidity and TSS Measured in the Peace River



**Average turbidity and TSS across the Peace River include both left bank and right bank.*

EcoFish Disclaimer: TSS:turbidity relationship used was the same all year. Note, these relationships are specific to a particular make/model of sensor. Please exercise caution if relationship applied to any data collected.

PAMs data before reservoir filling, and the replacement background stations just downstream of the tailrace PBM left and right bank are the closest measurements to the site.

Figure 6: pH at River Road Locations

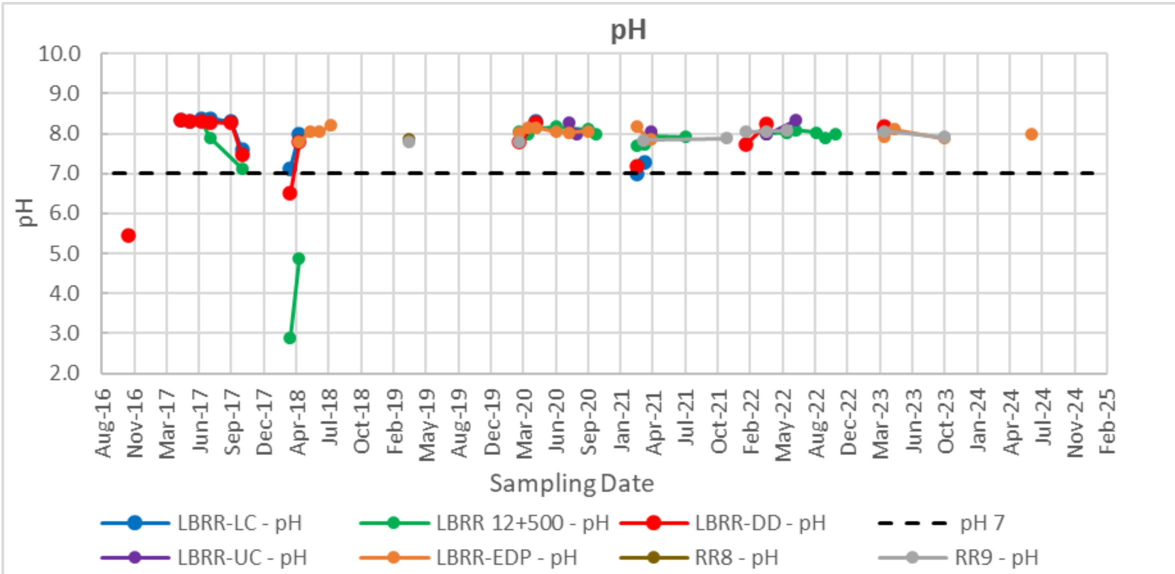


Figure 7: Total Alkalinity at River Road Locations

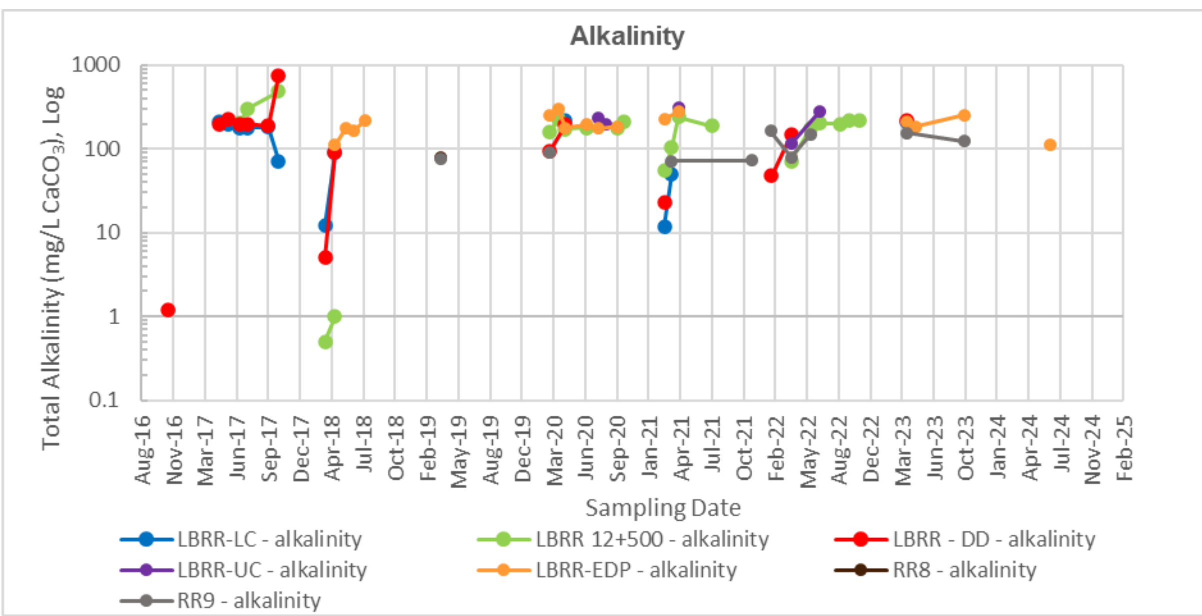


Figure 8: Acidity at River Road Locations

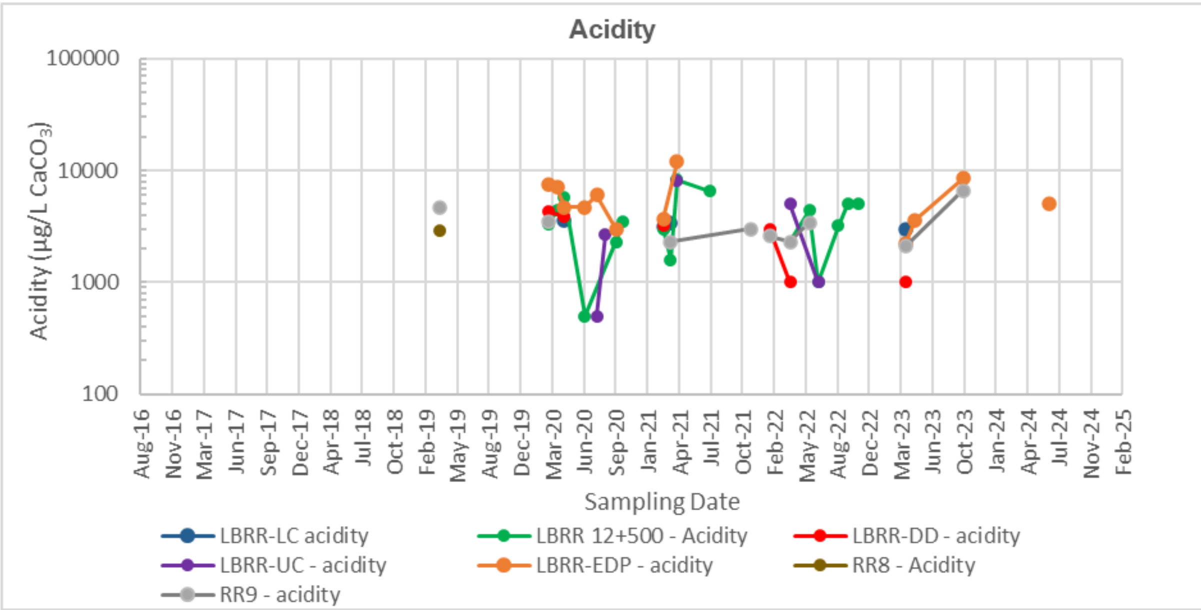


Figure 9: Sulphate at River Road Locations

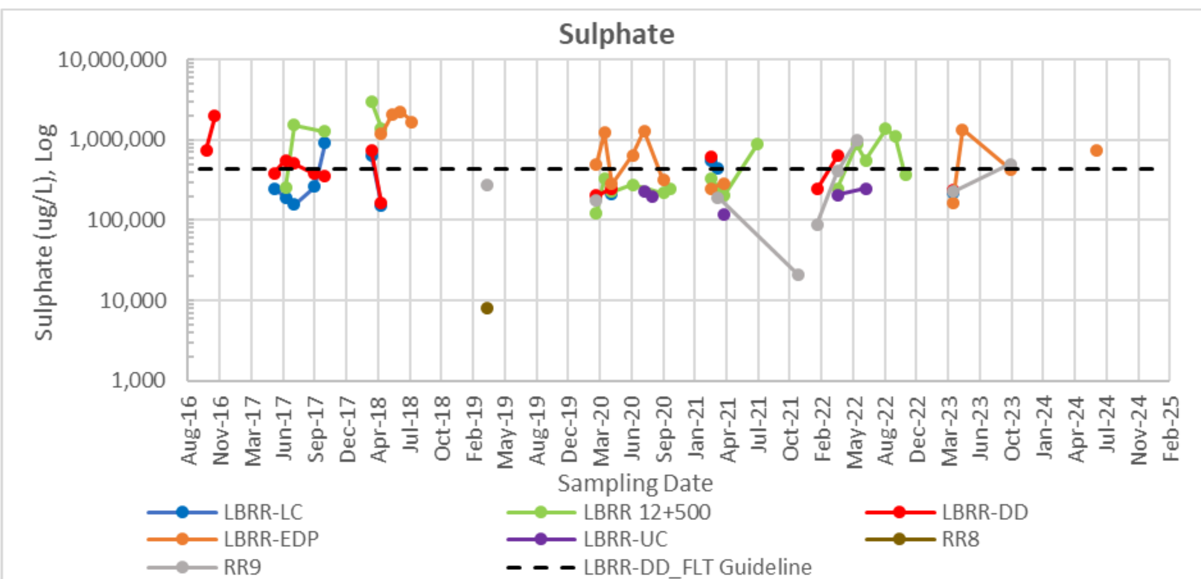


Figure 10a: Total Dissolved Solids (TDS) at River Road Locations

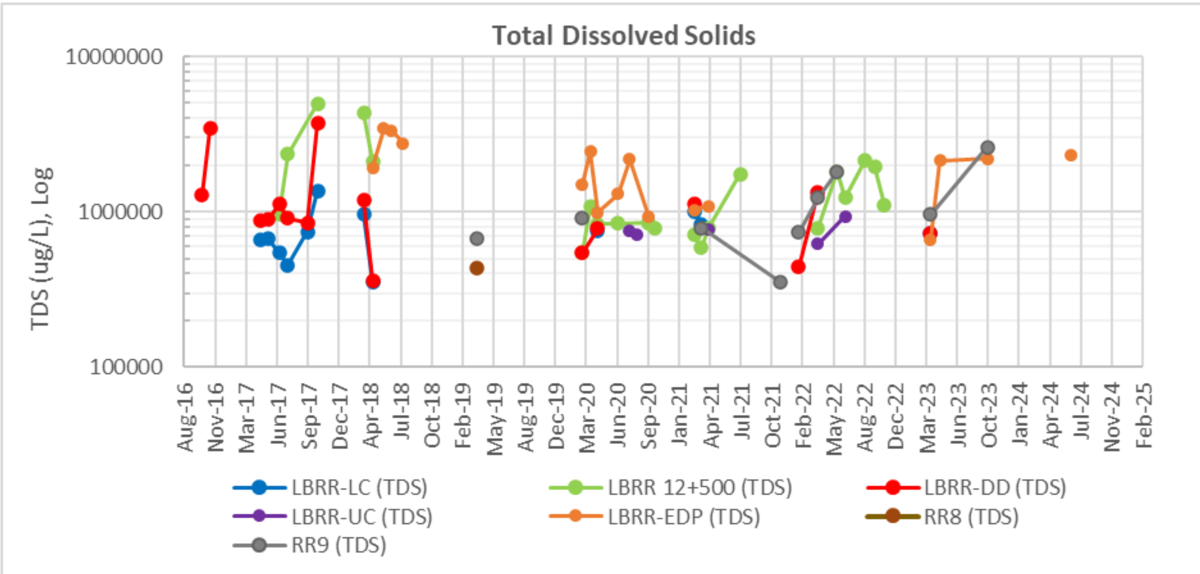


Figure 10b: Total Suspended Solids (TSS) at River Road Locations

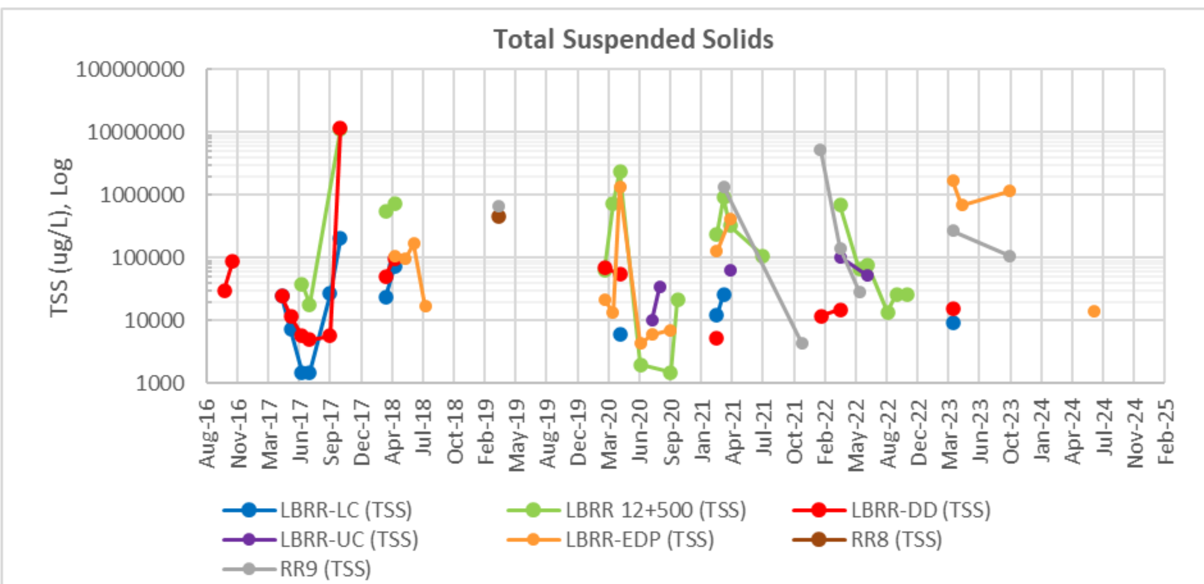


Figure 11a: Total Aluminum at River Road Locations

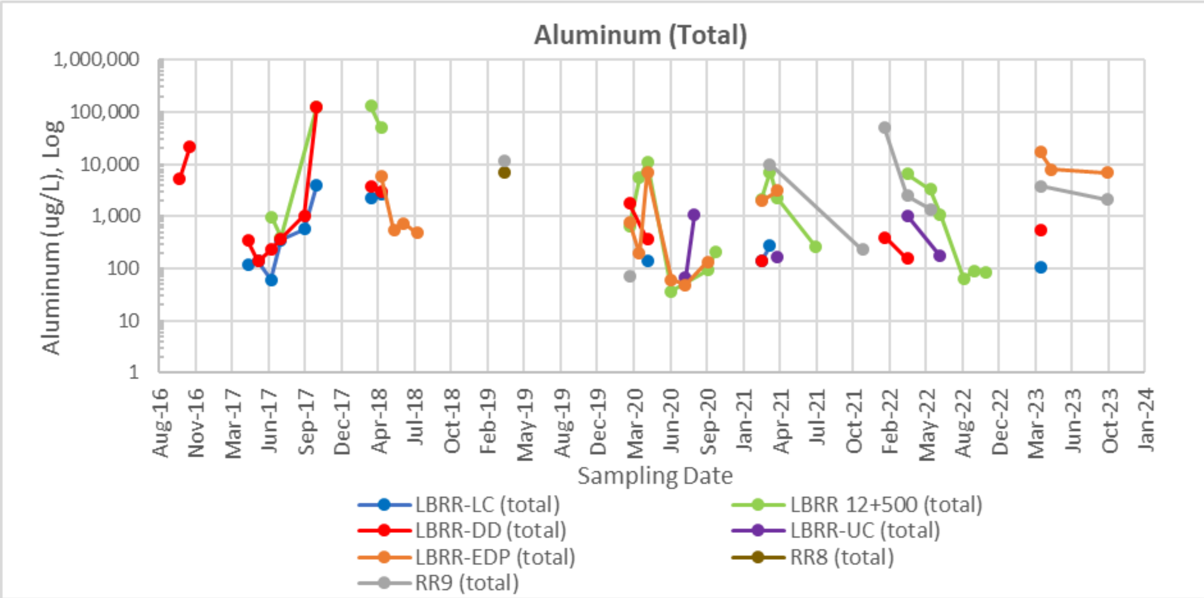


Figure 11b: Dissolved Aluminum at River Road Locations

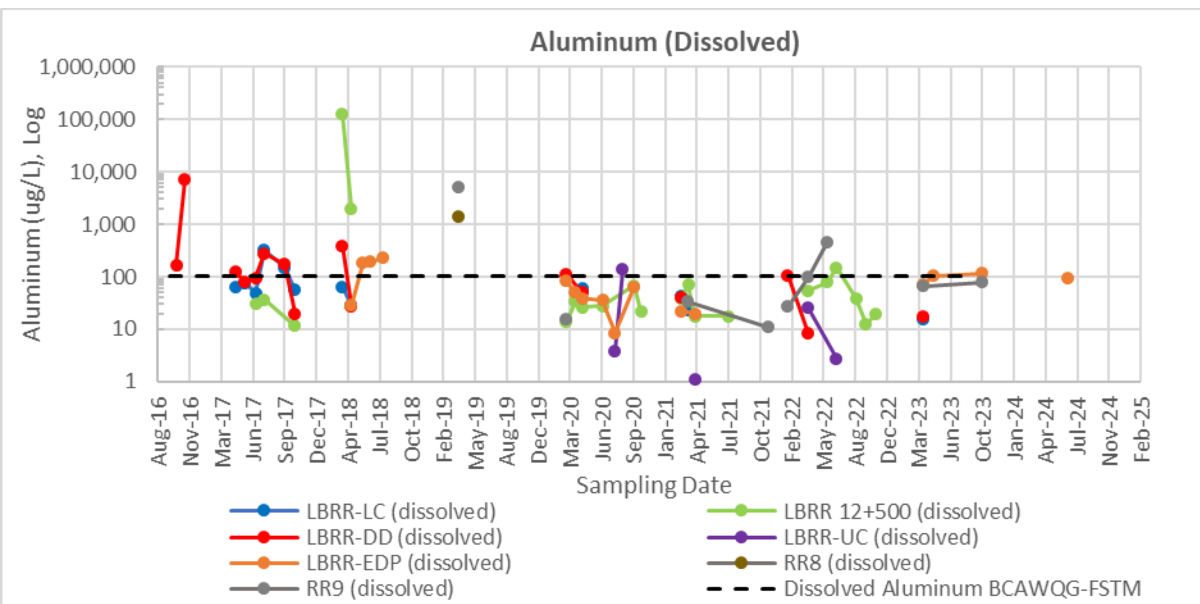


Figure 12a: Total Iron at River Road Locations

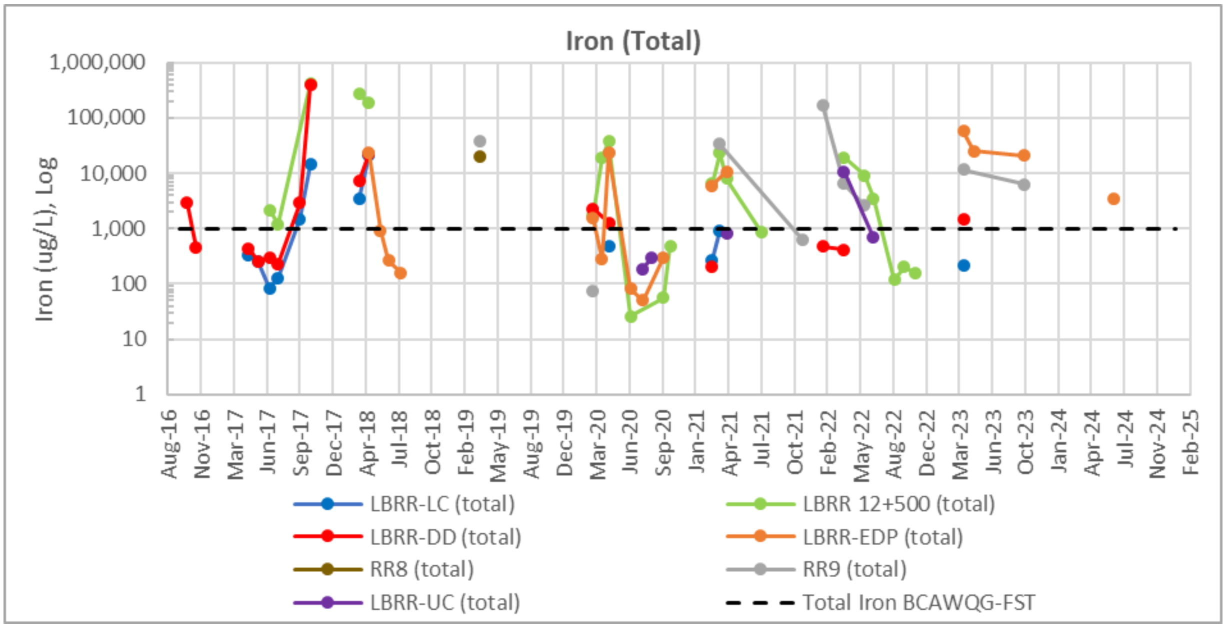


Figure 12b: Dissolved Iron at River Road Locations

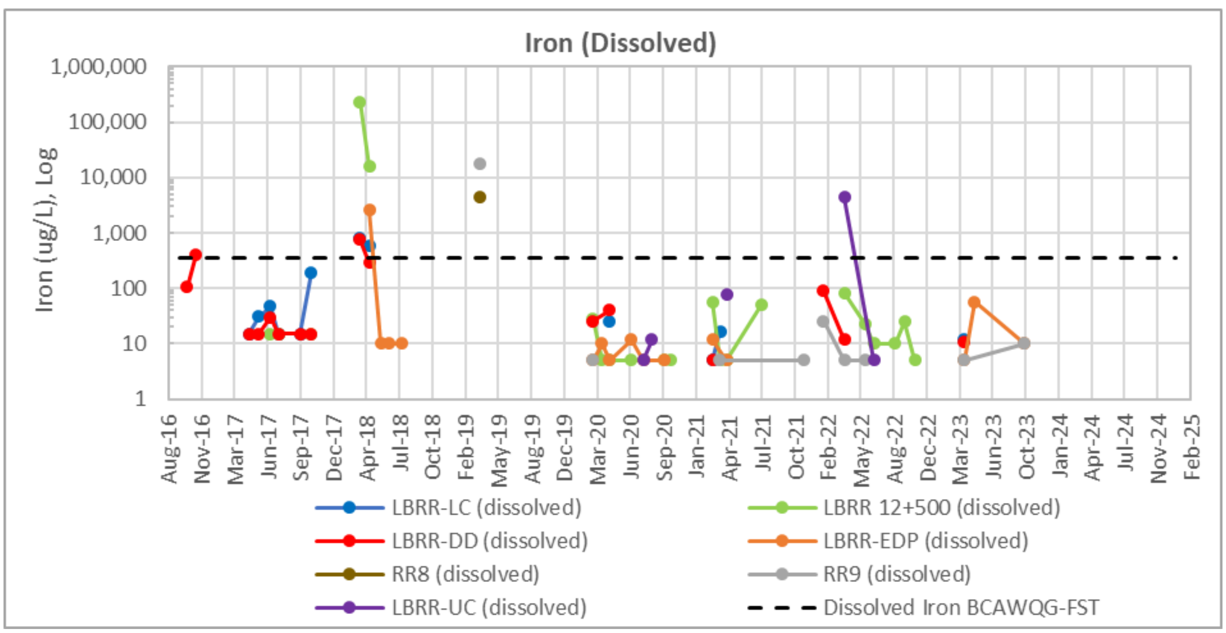


Figure 13: Total Arsenic at River Road Locations

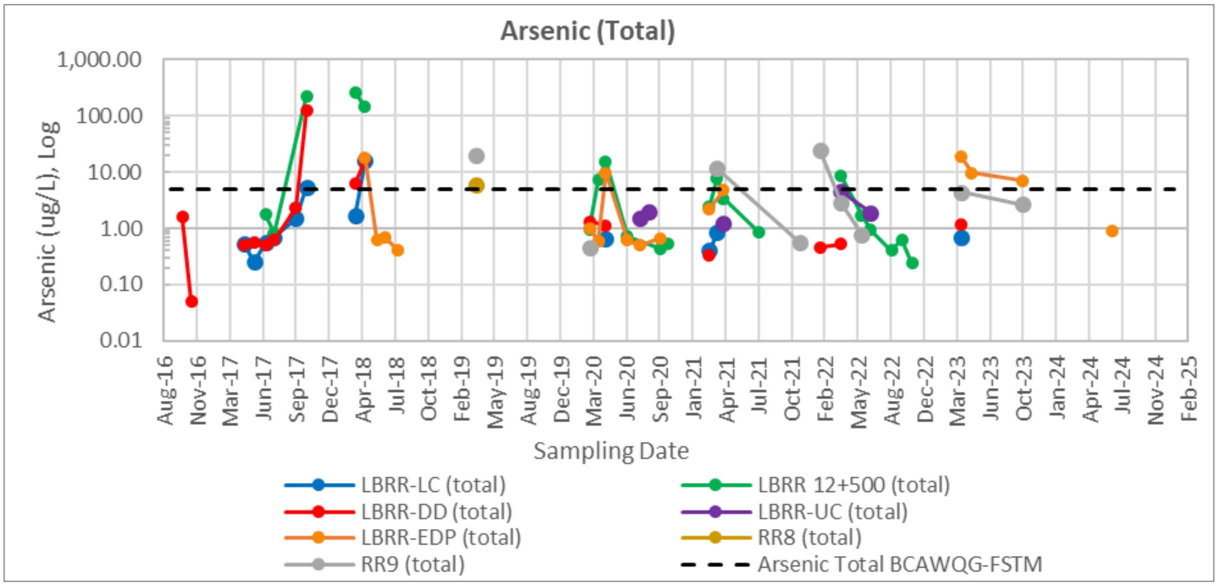


Figure 14: Dissolved Cadmium at River Road Locations

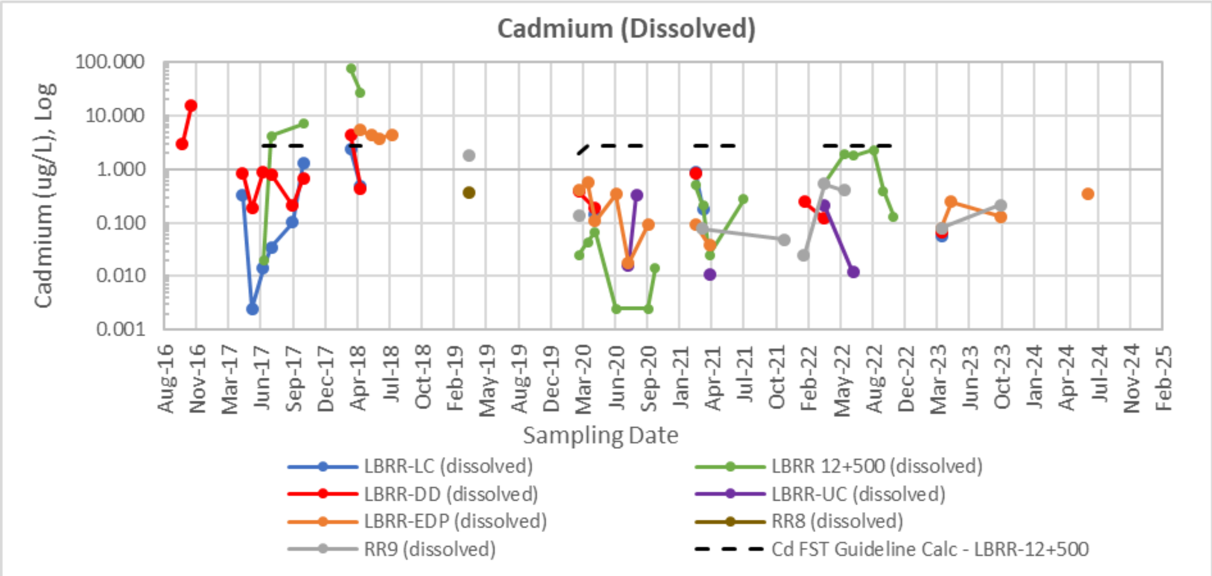


Figure 15: Total Cobalt at River Road Locations

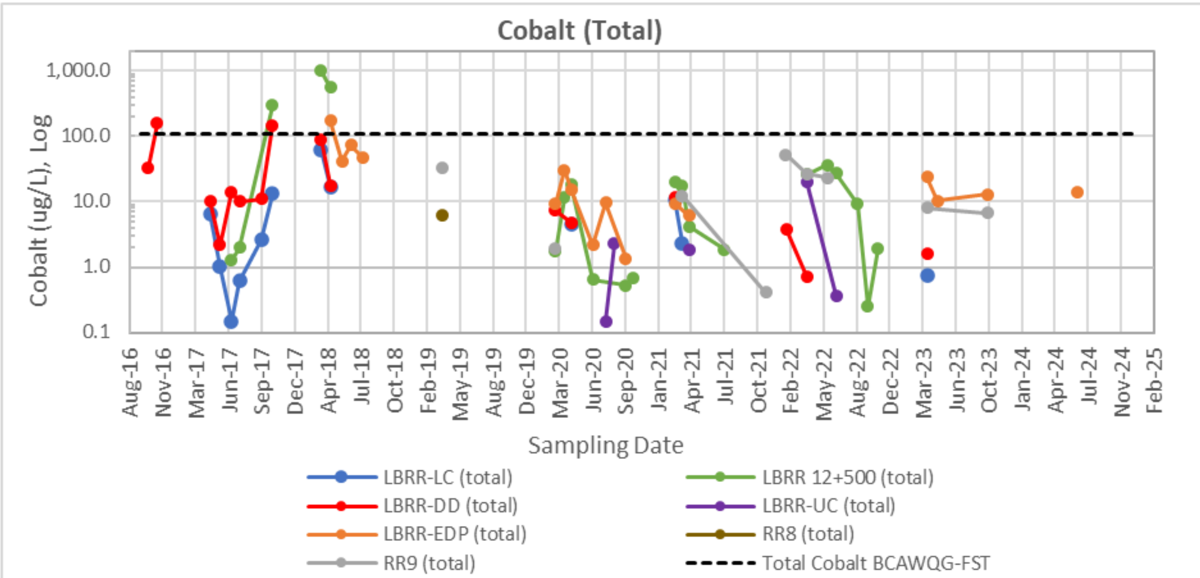


Figure 16: Dissolved Copper at River Road Locations

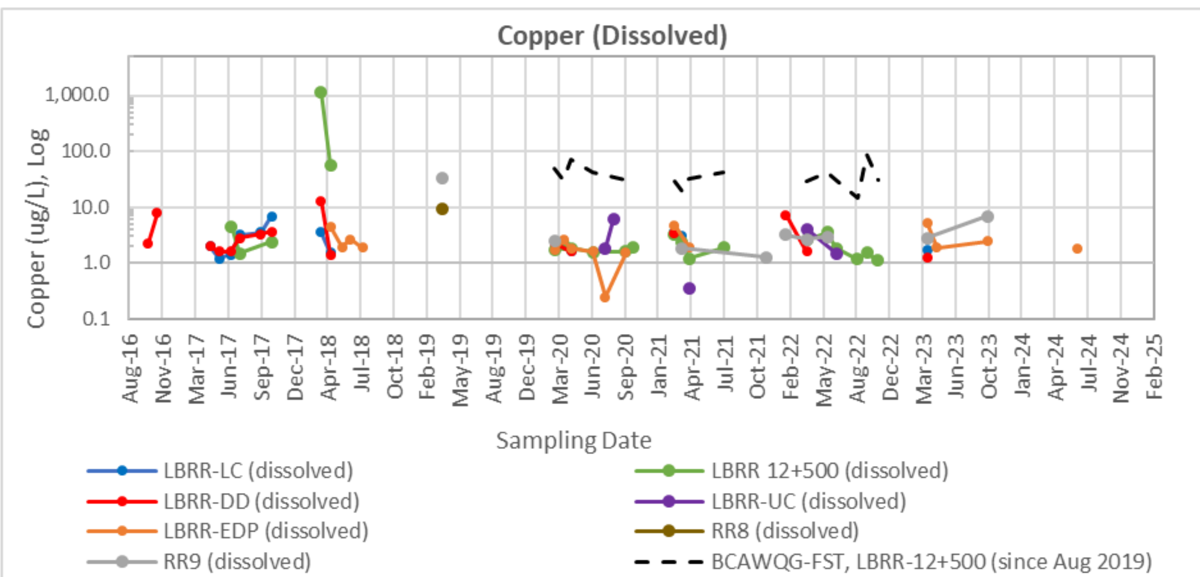


Figure 17a: Total Zinc at River Road Locations

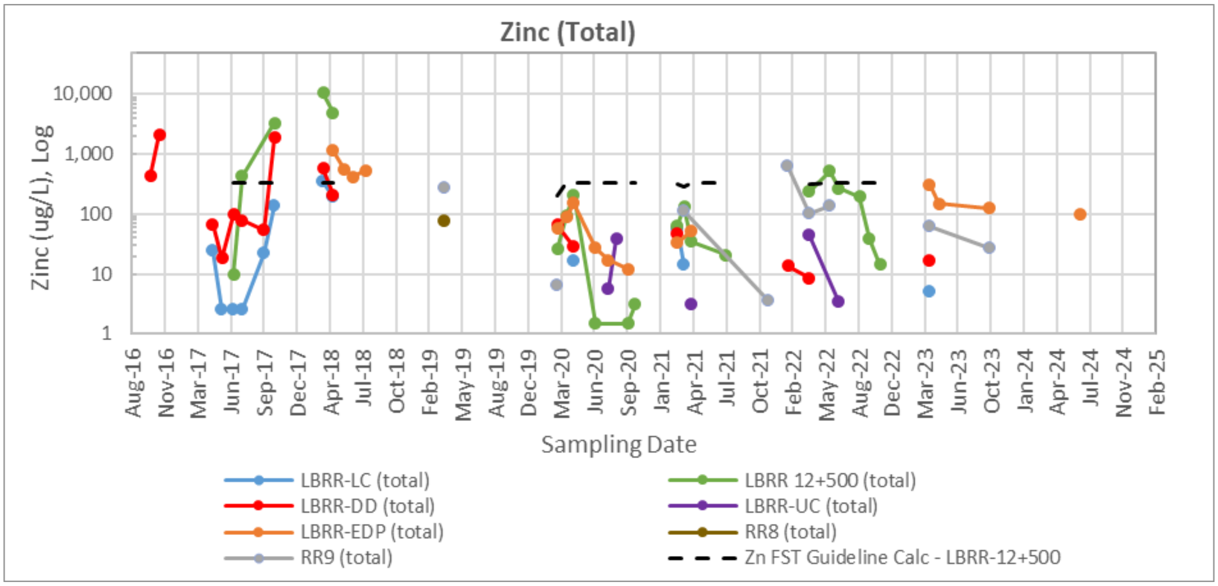


Figure 17b: Dissolved Zinc at River Road Locations

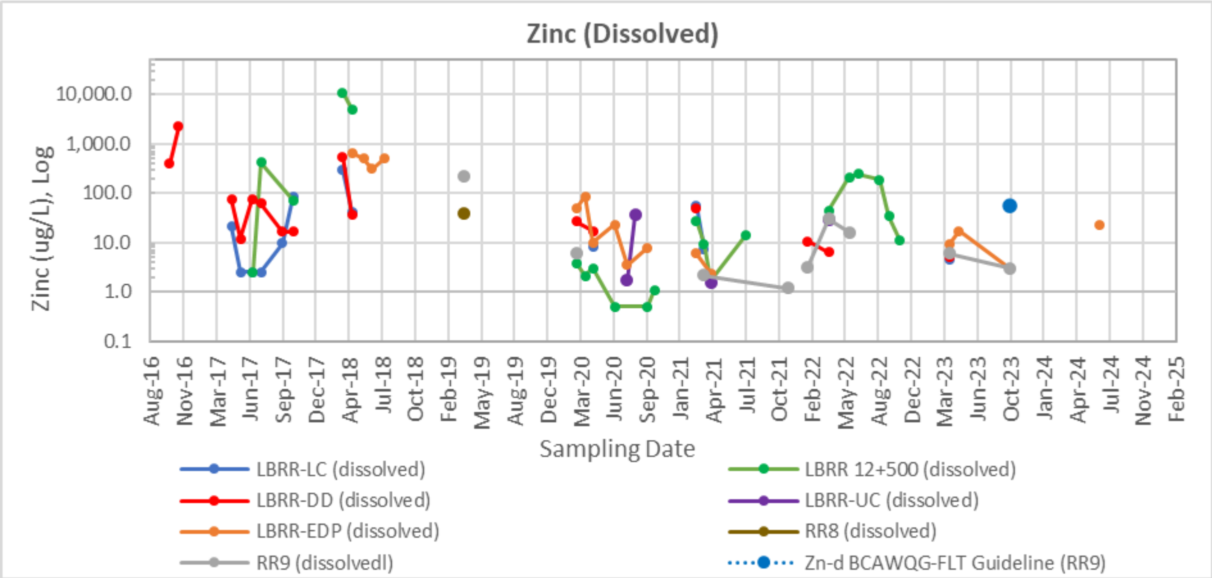


Figure 18: pH at RBSBIAR Locations

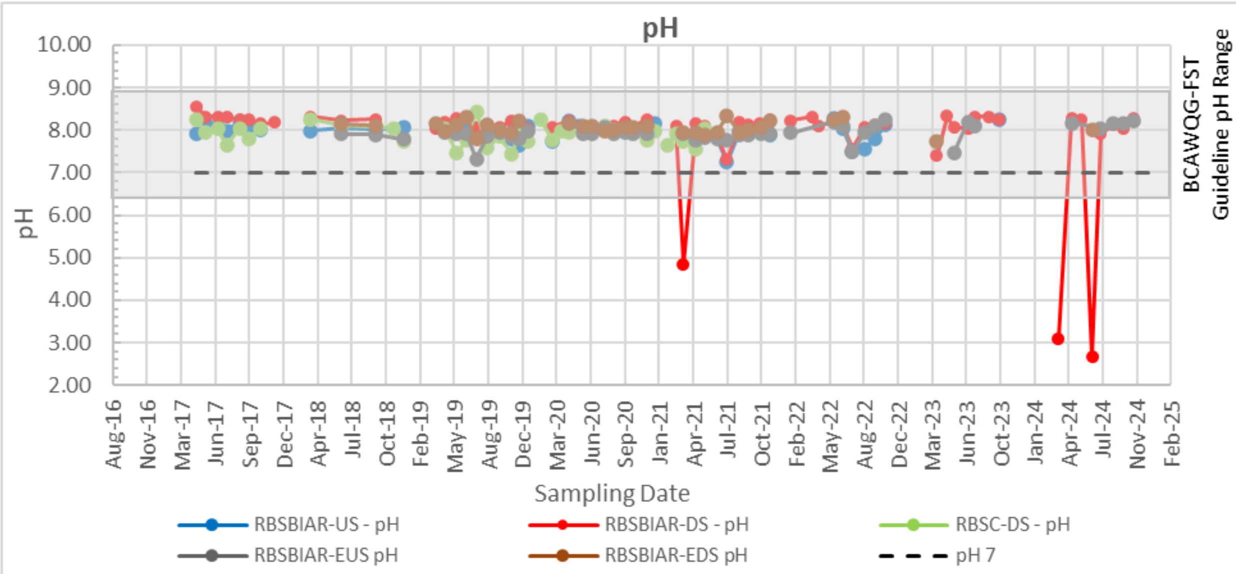


Figure 19: Total Alkalinity at RBSBIAR Locations

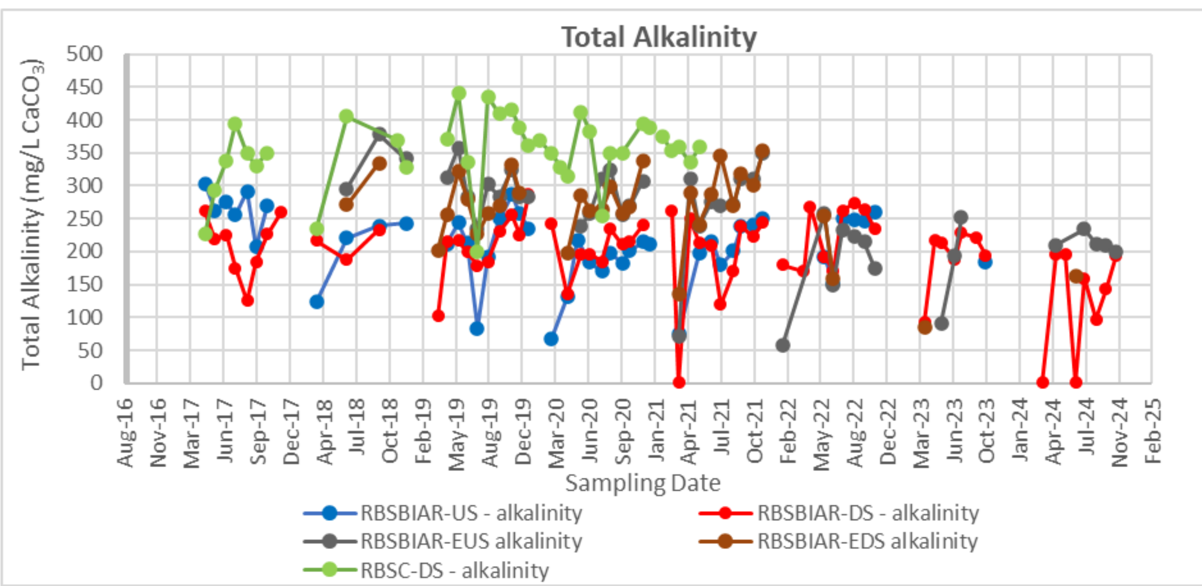


Figure 20: Acidity at RBSBIAR Locations

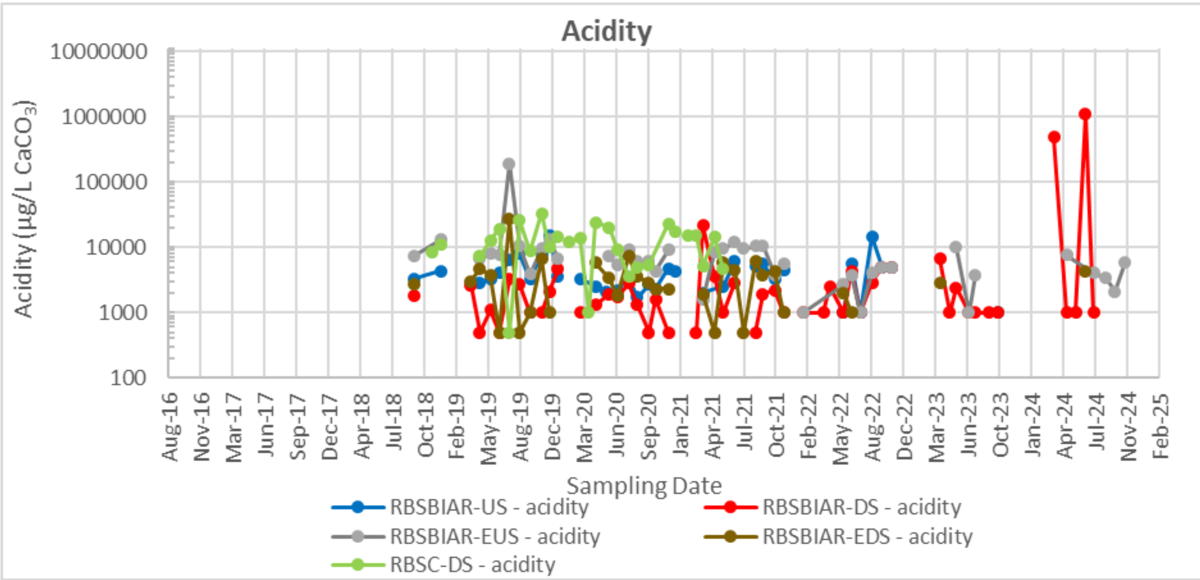


Figure 21: Sulphate at RBSBIAR Locations

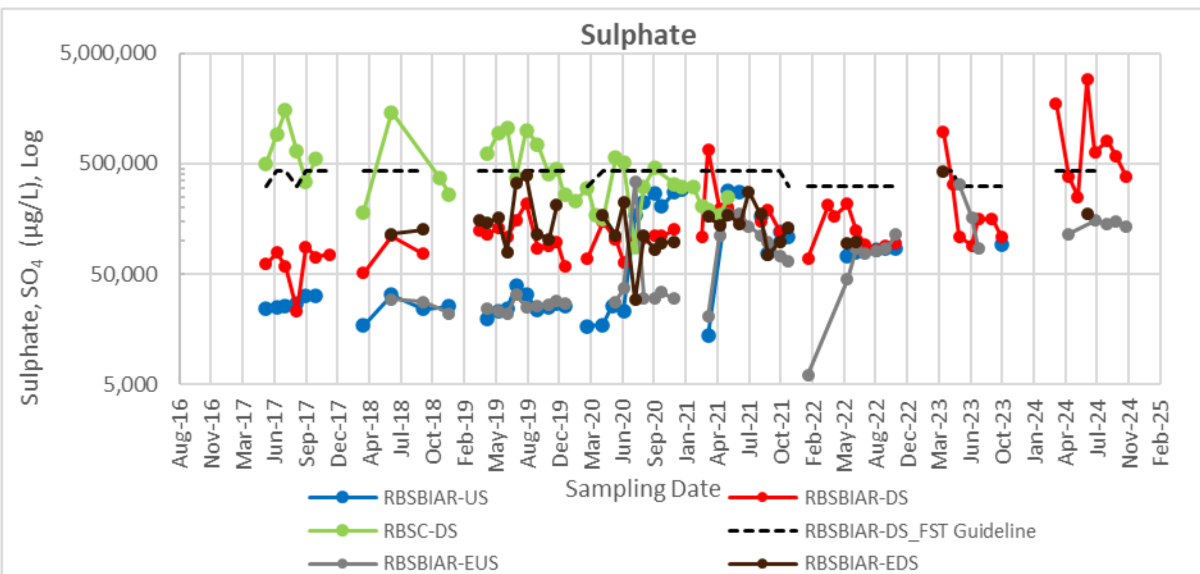


Figure 22a: Total Dissolved Solids (TDS) at RBSBIAR Locations

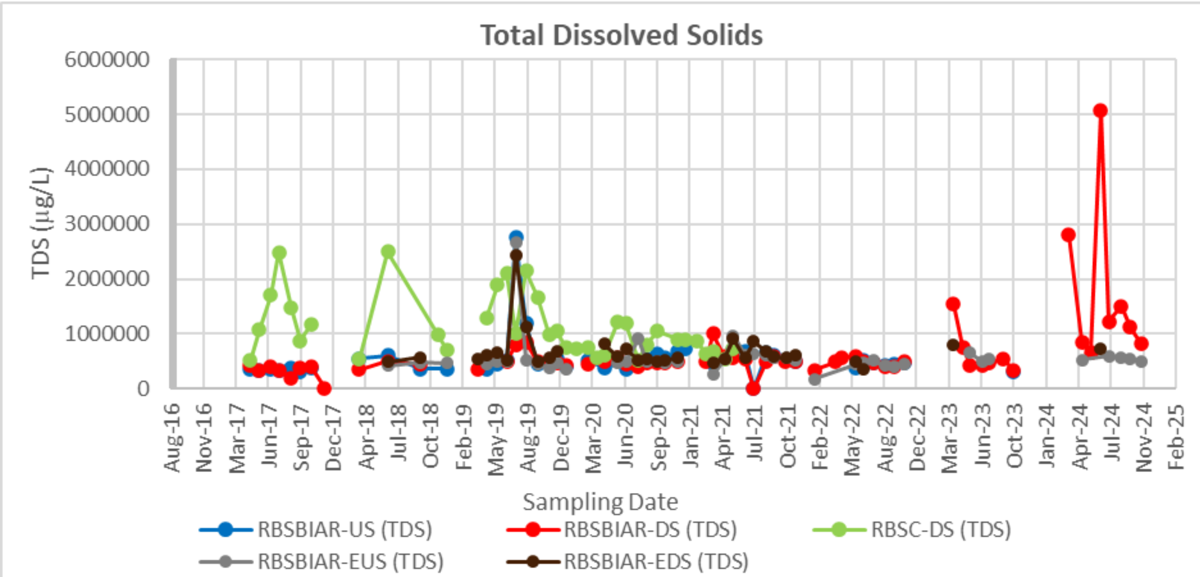


Figure 22b: Total Suspended Solids (TSS) at RBSBIAR Locations

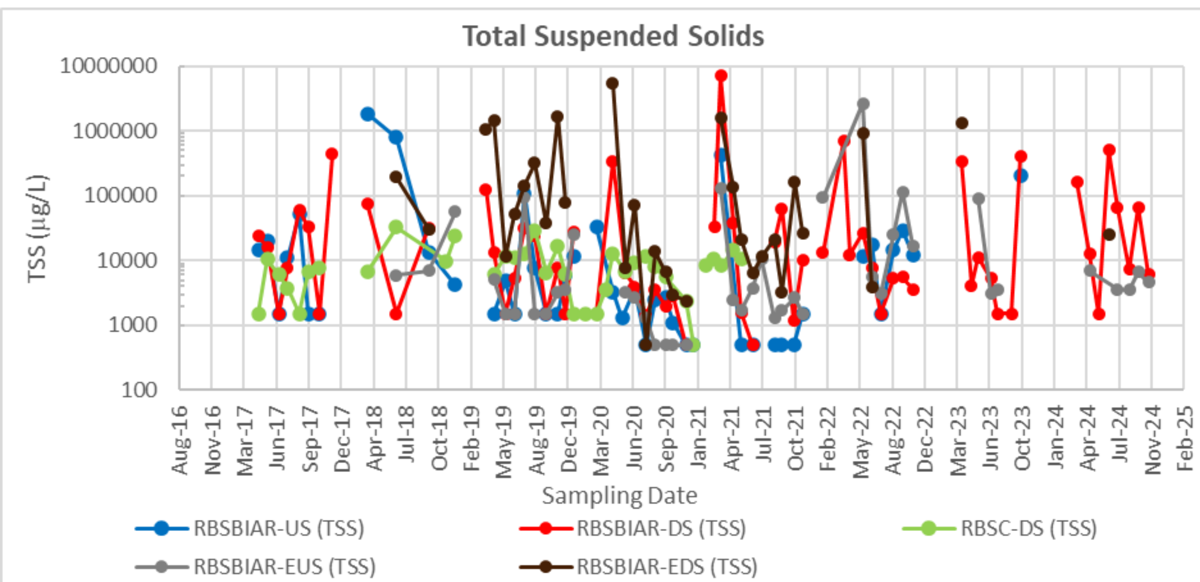


Figure 23a: Total Aluminum at RBSBIAR Locations

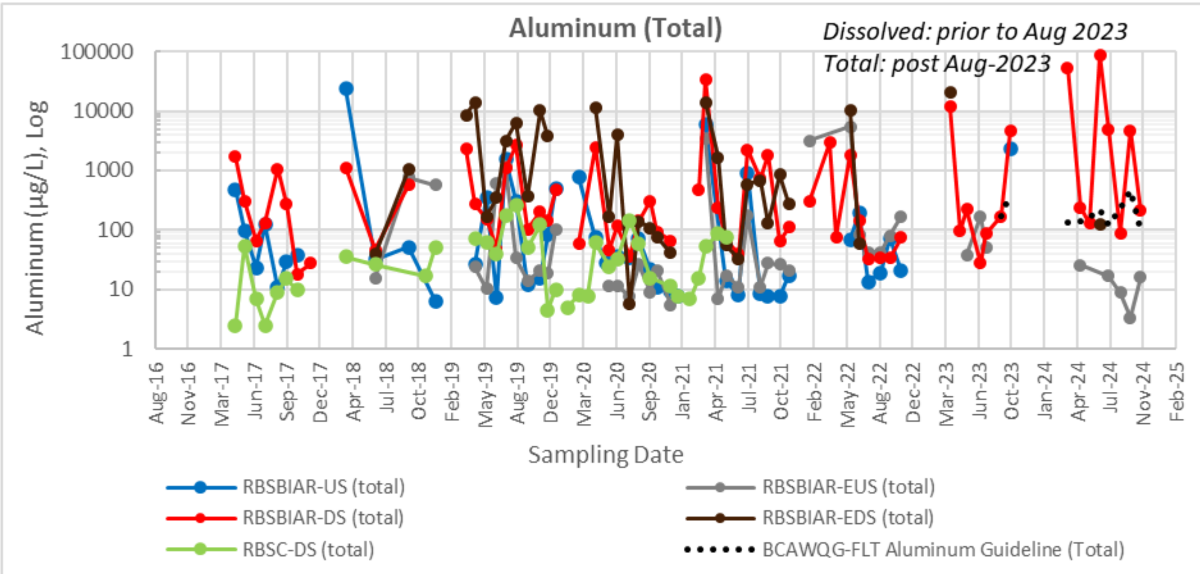


Figure 23b: Dissolved Aluminum at RBSBIAR Locations

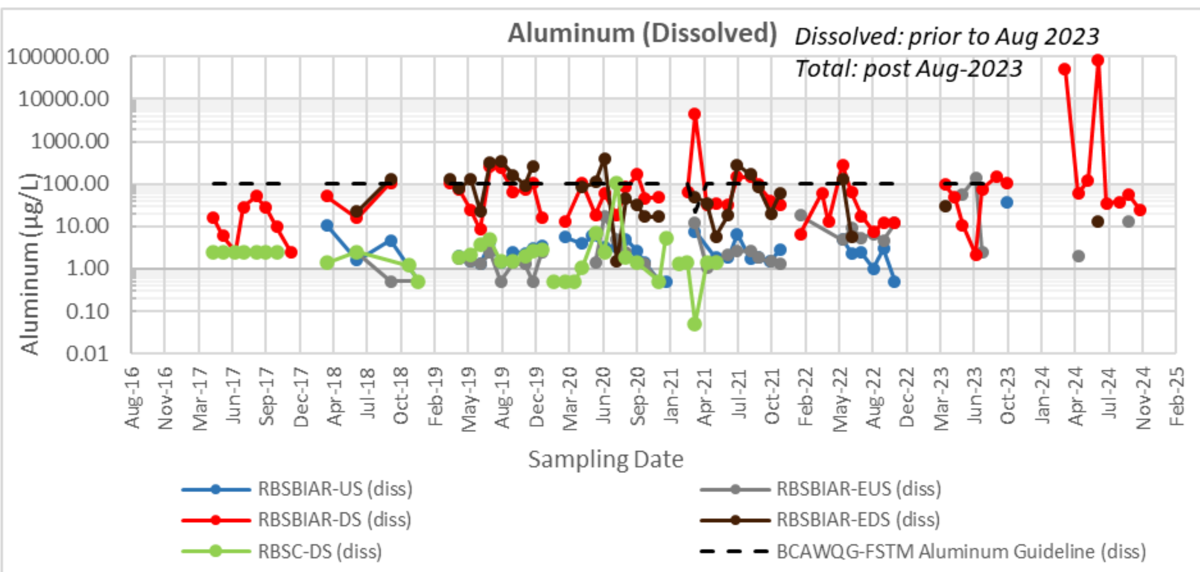


Figure 24a: Total Iron at RBSBIAR Locations

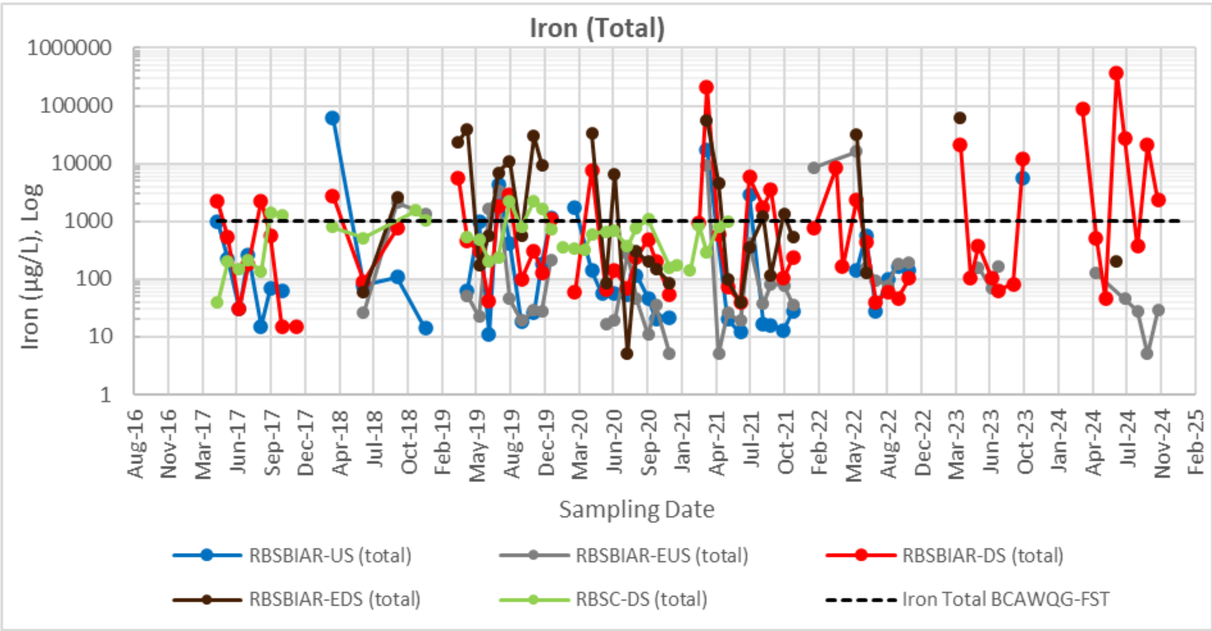


Figure 24b: Dissolved Iron at RBSBIAR Locations

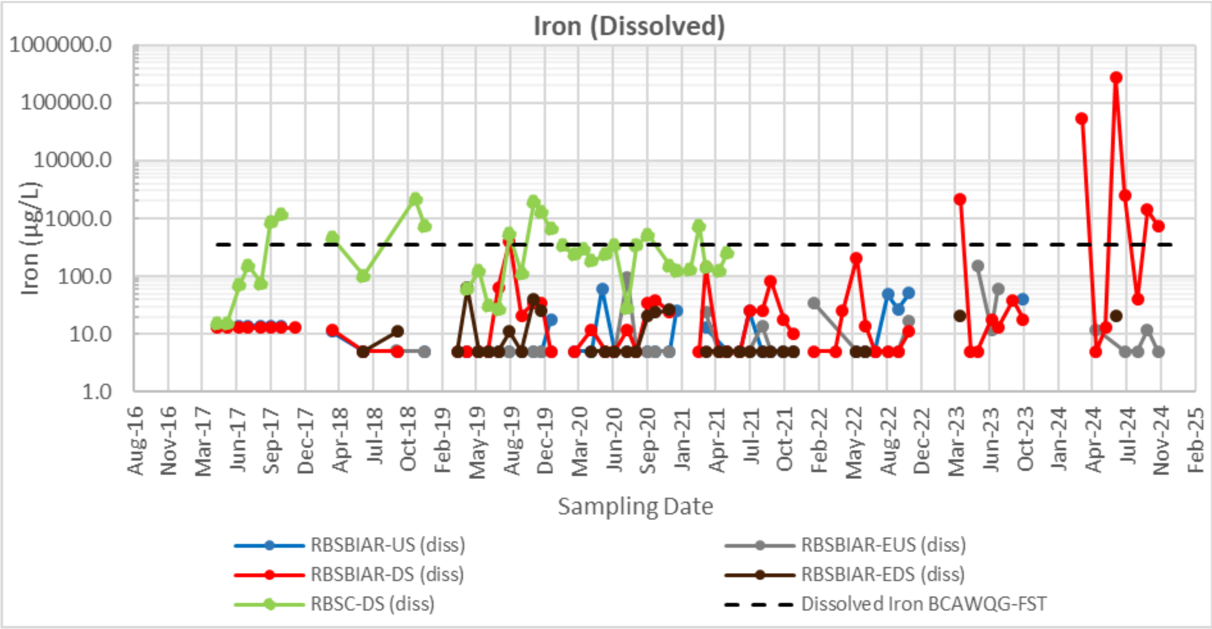


Figure 25a: Total Arsenic at RBSBIAR Locations

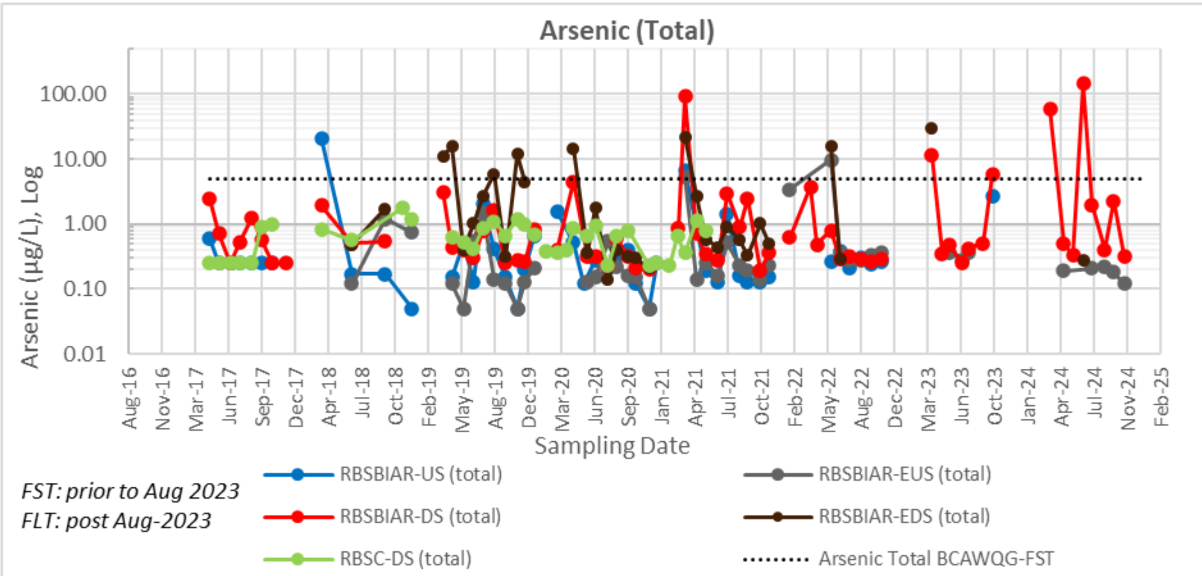


Figure 25b: Dissolved Arsenic at RBSBIAR Locations

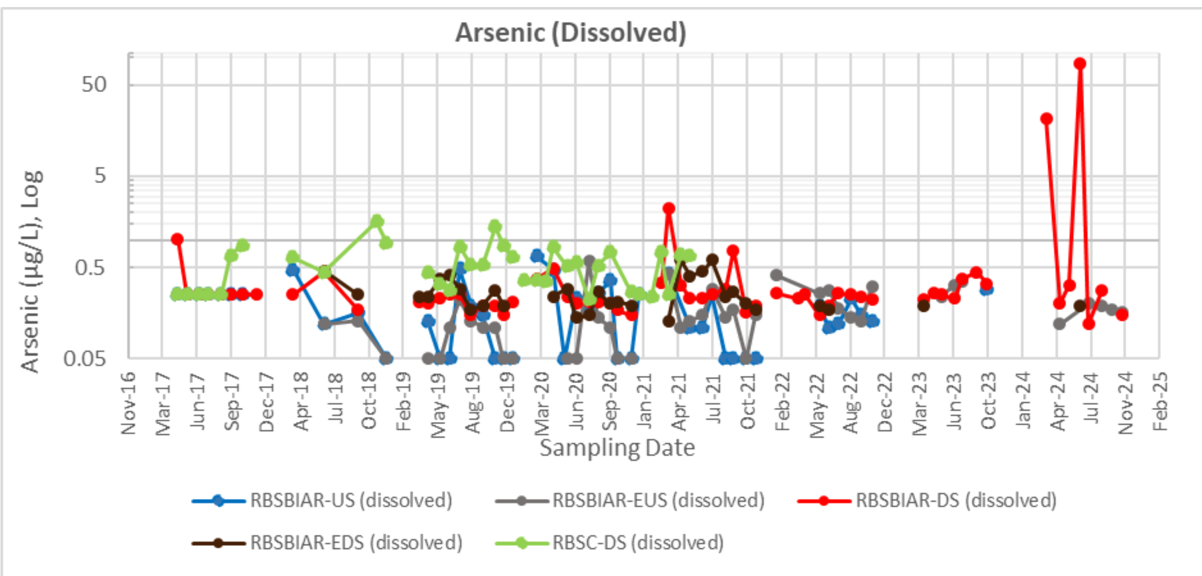


Figure 26a: Total Cadmium at RBSBIAR Locations

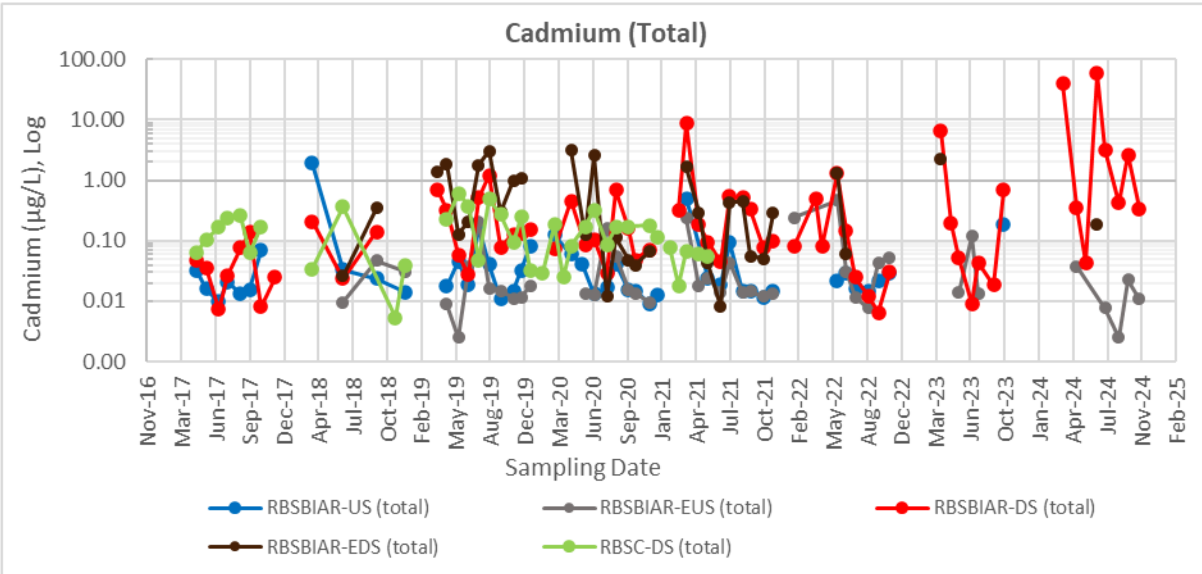


Figure 26b: Dissolved Cadmium at RBSBIAR Locations

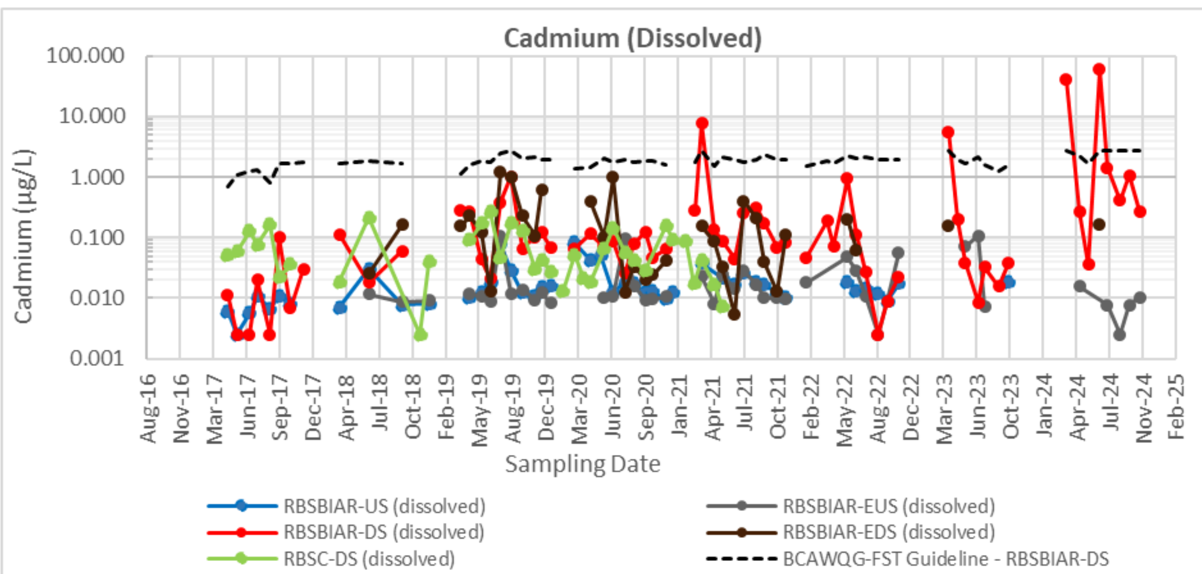


Figure 27a: Total Cobalt at RBSBIAR Locations

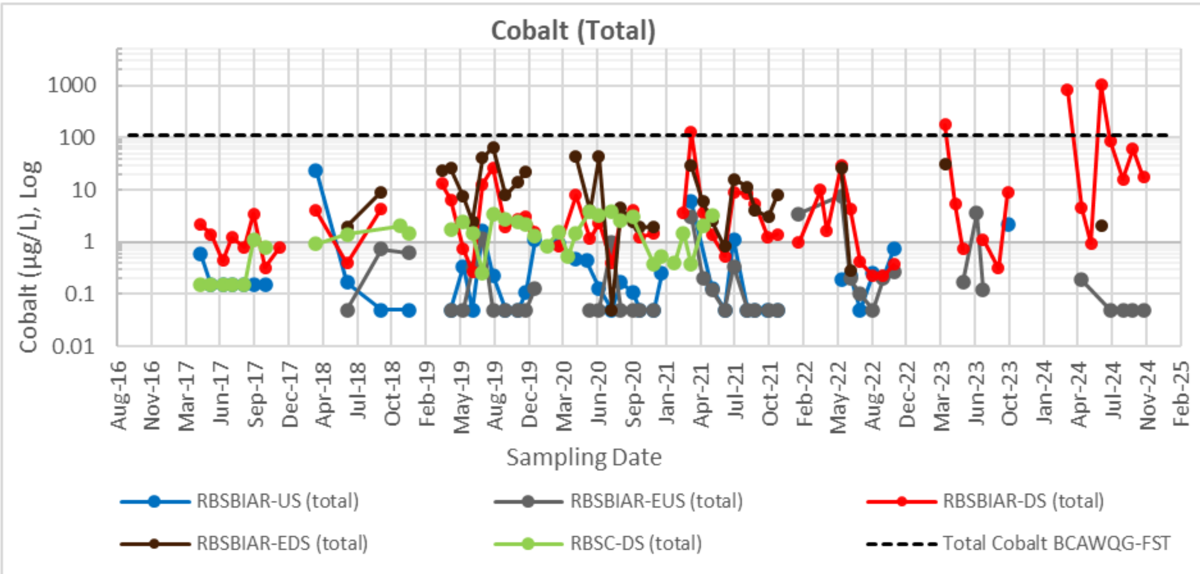


Figure 27b: Dissolved Cobalt at RBSBIAR Locations

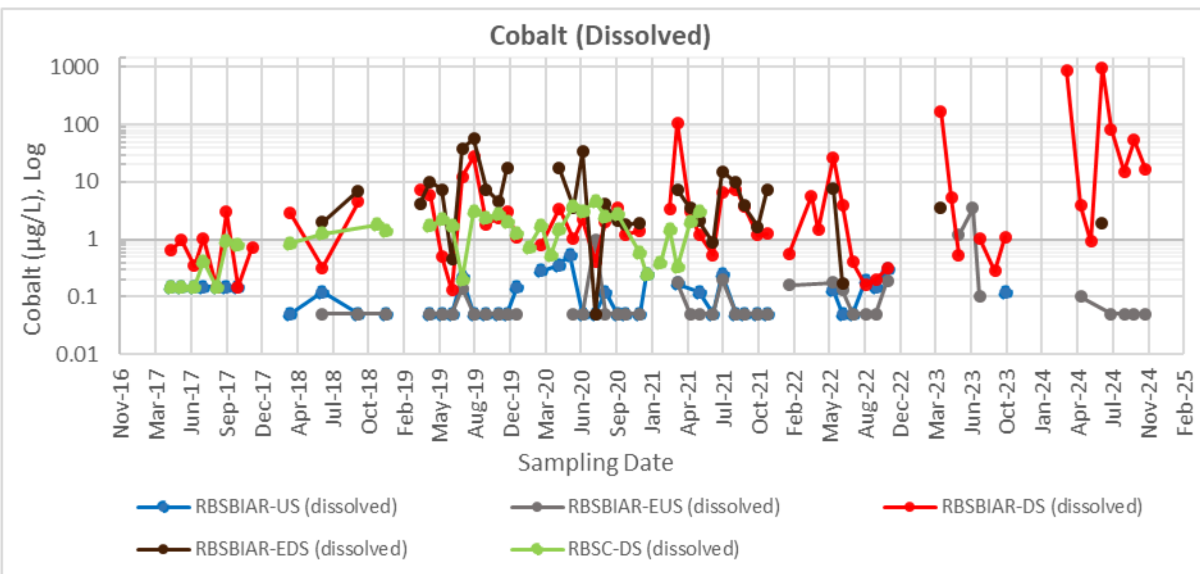


Figure 28a: Total Copper at RBSBIAR Locations

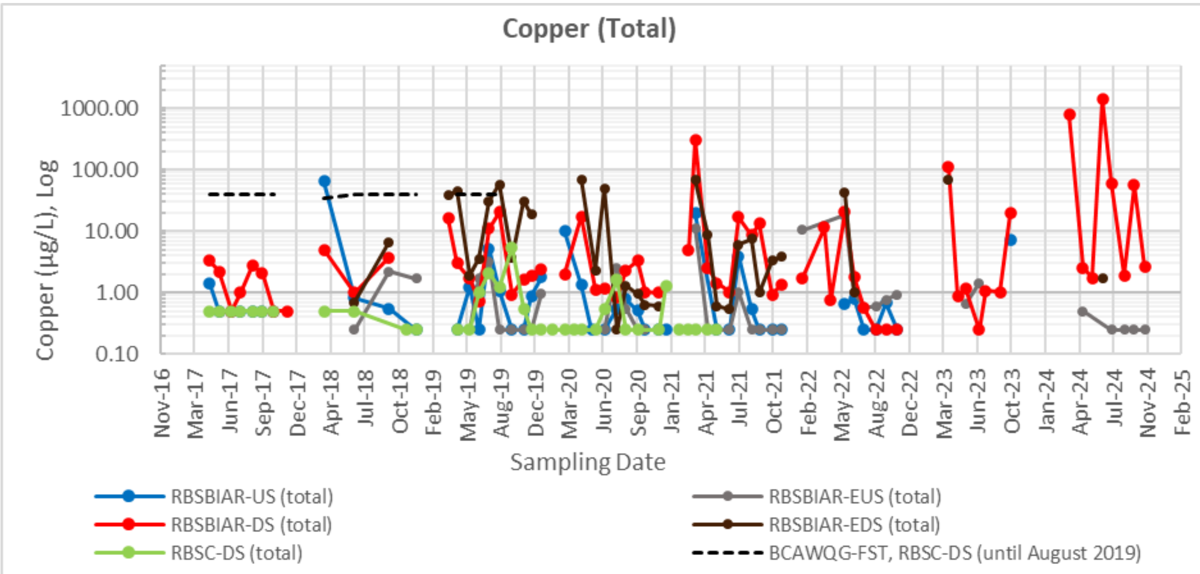


Figure 28b: Dissolved Copper at RBSBIAR Locations

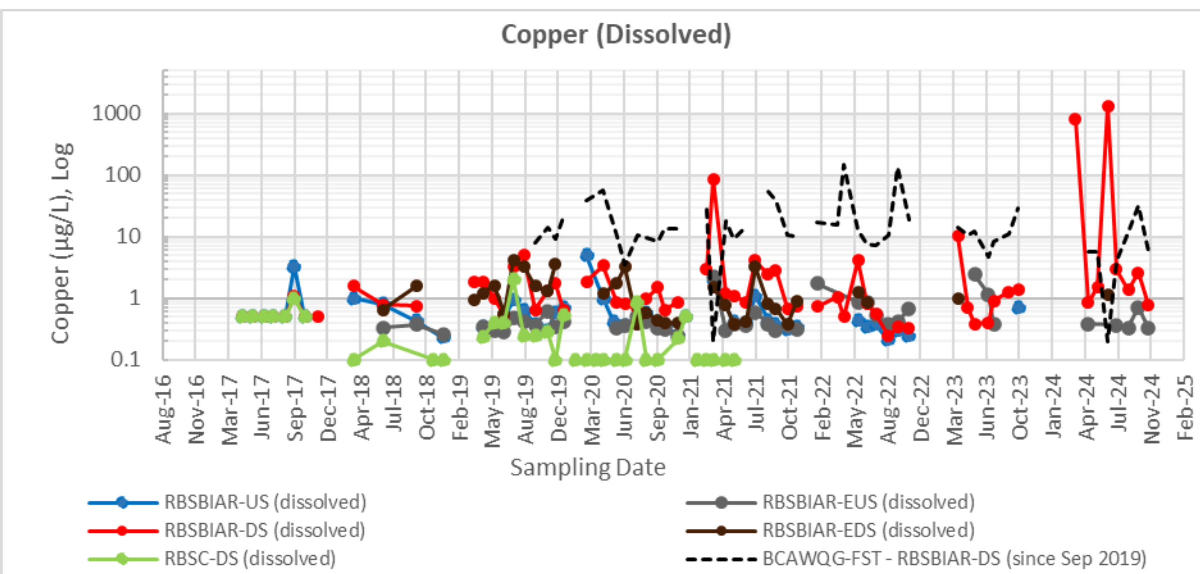


Figure 29a: Total Zinc at RBSBIAR Locations

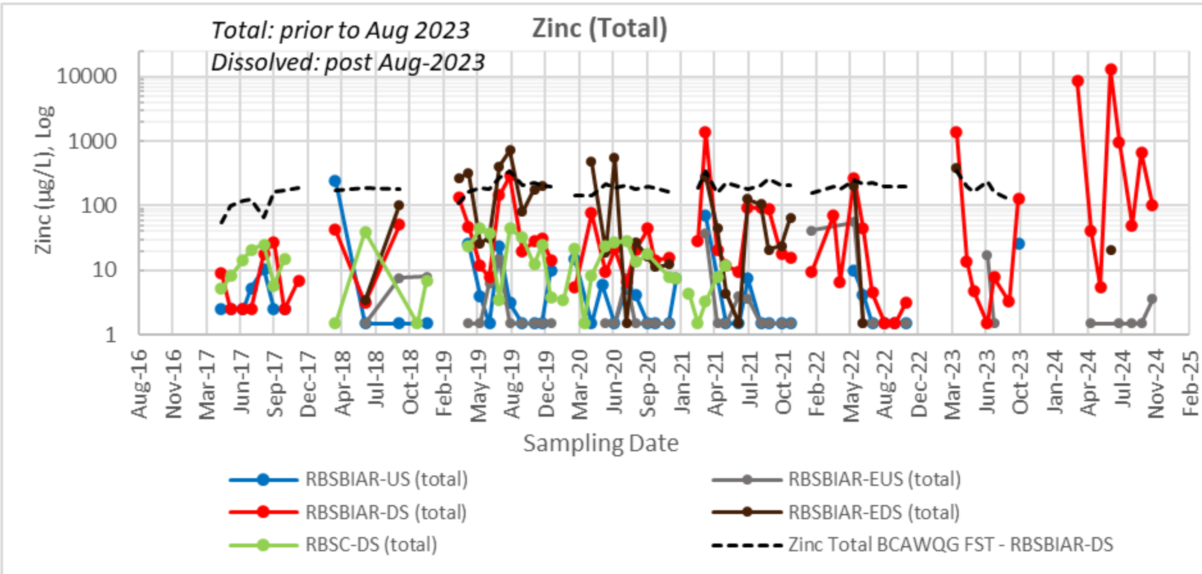


Figure 29b: Dissolved Zinc at RBSBIAR Locations

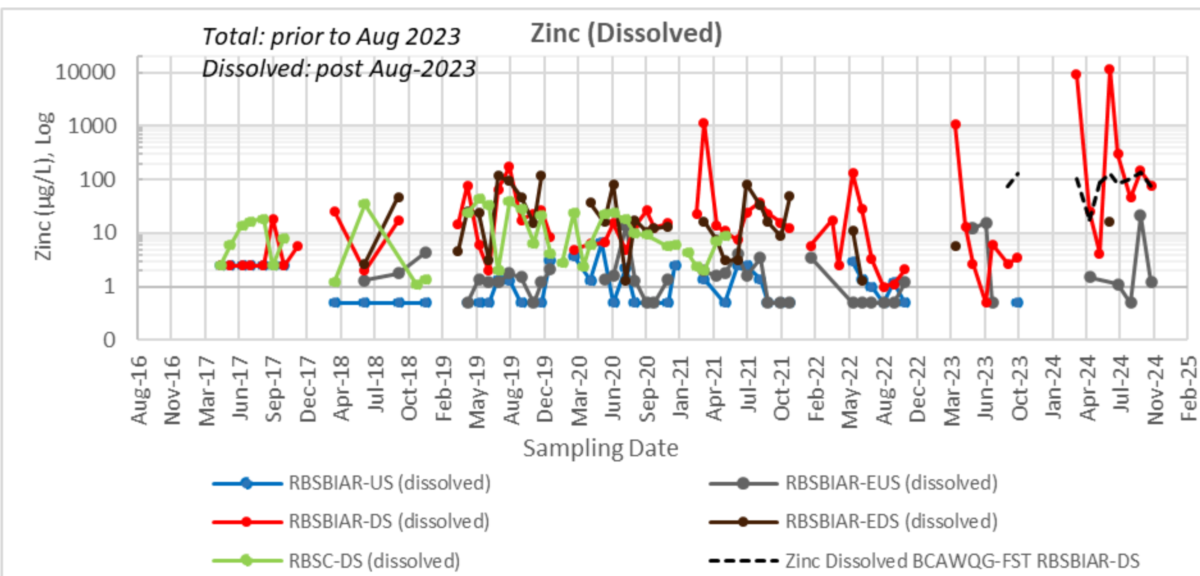


Figure 30: Total Manganese at RBSBIAR Locations

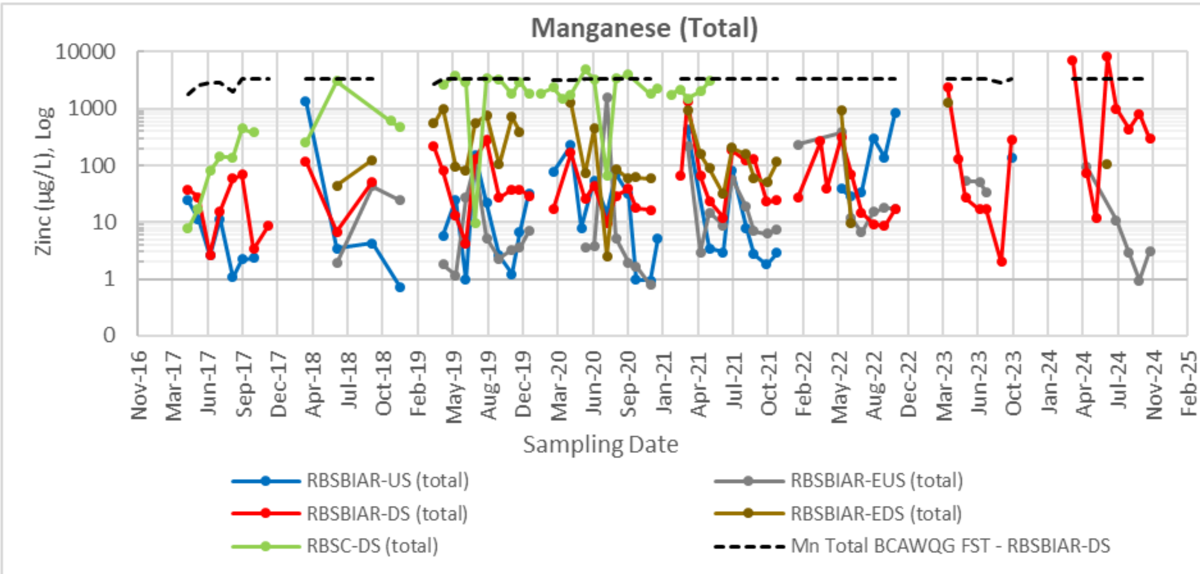


Figure 31: Ammonia at RBSBIAR Locations

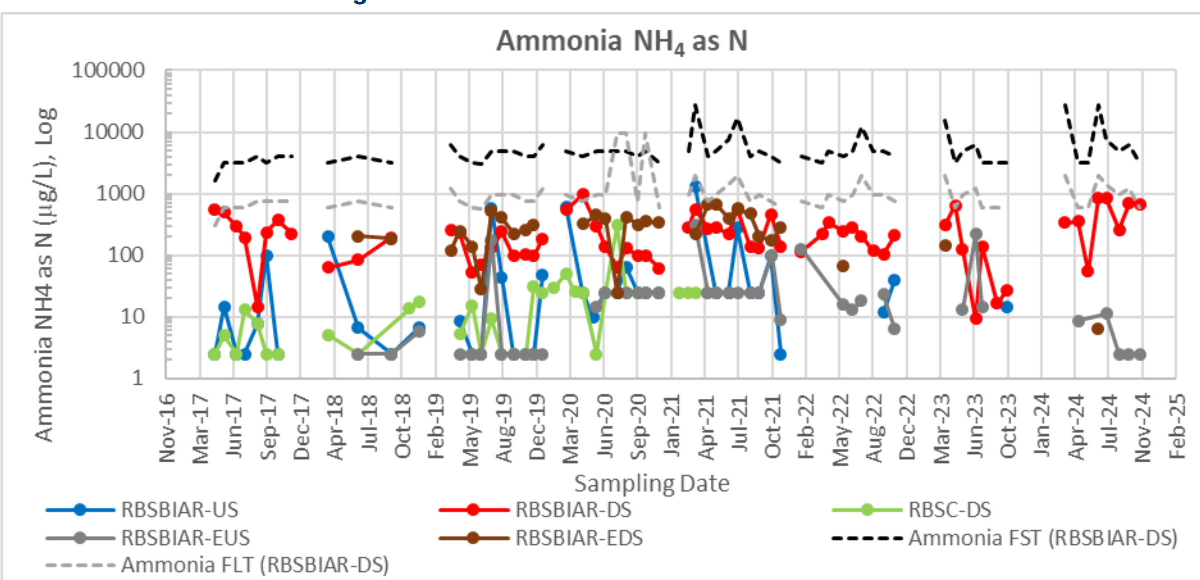


Figure 32a: Total Selenium at RBSBIAR Locations

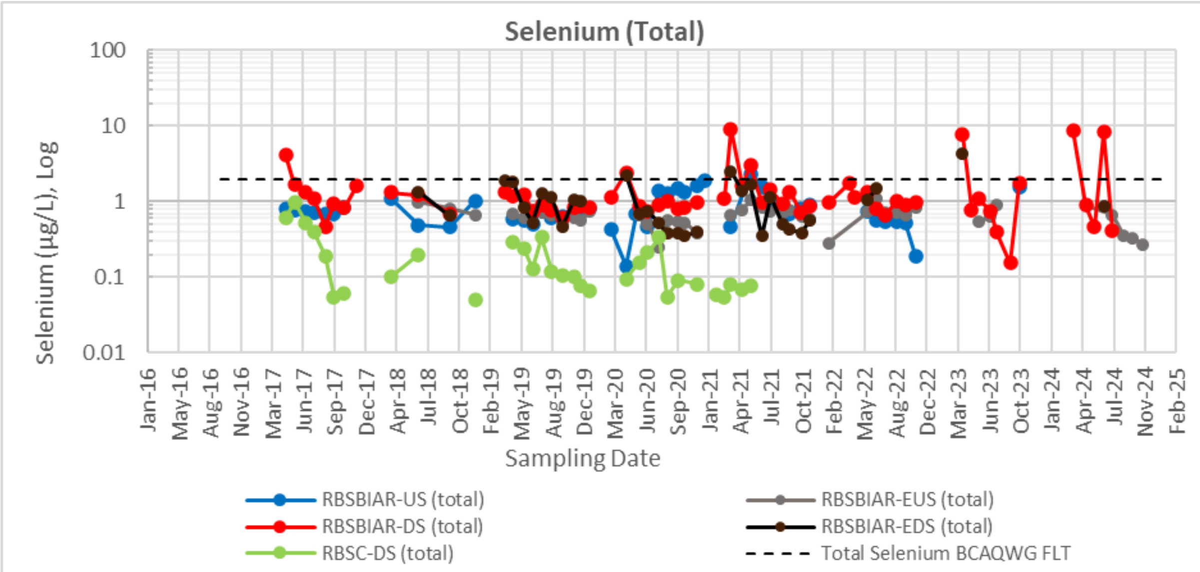


Figure 32b: Dissolved Selenium at RBSBIAR Locations

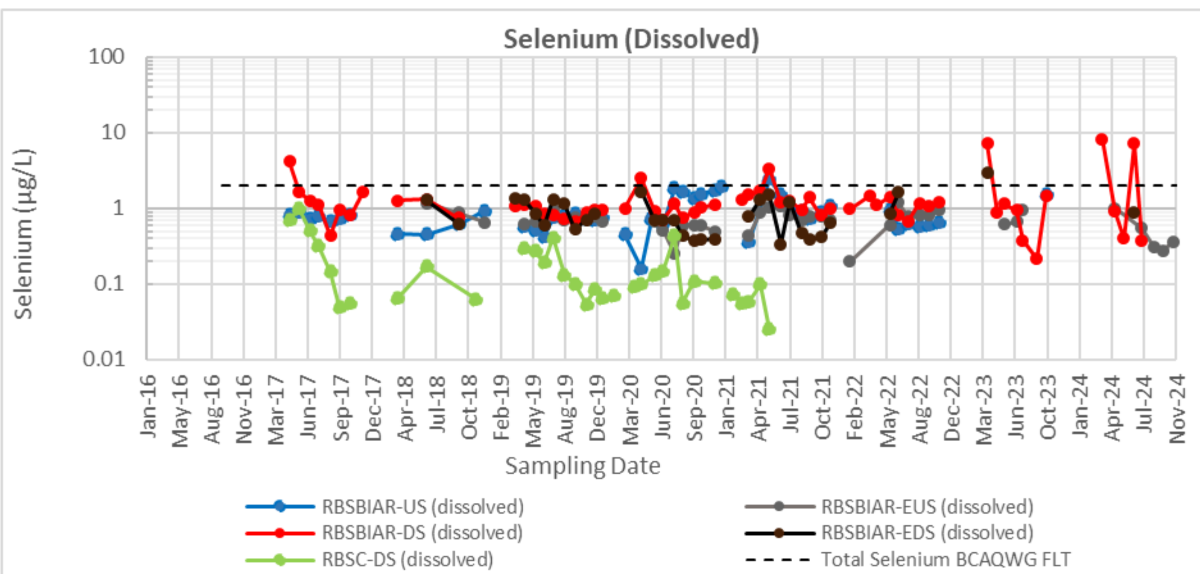


Figure 33: pH at LBDB Locations

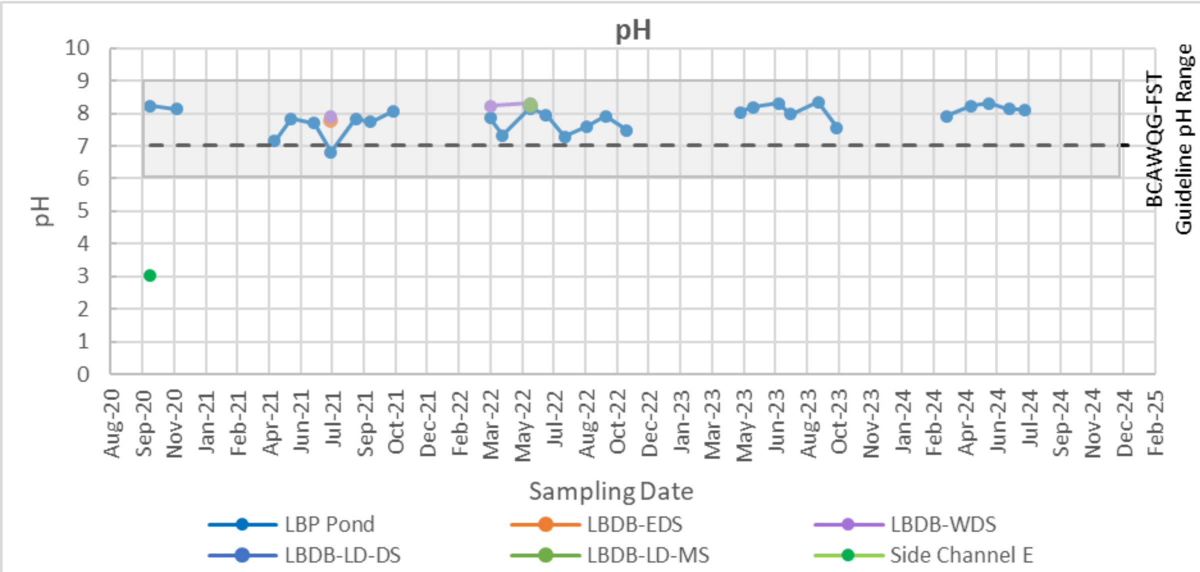
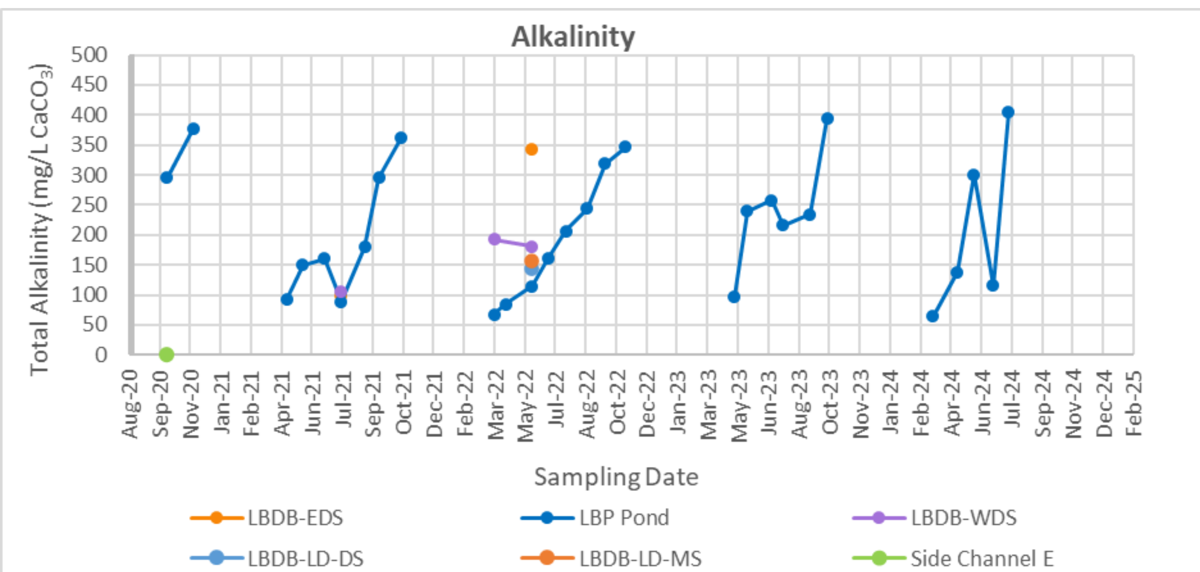


Figure 34: Total Alkalinity at LBDB Locations



TETRA TECH

Figure 35: Acidity at LBDB Locations

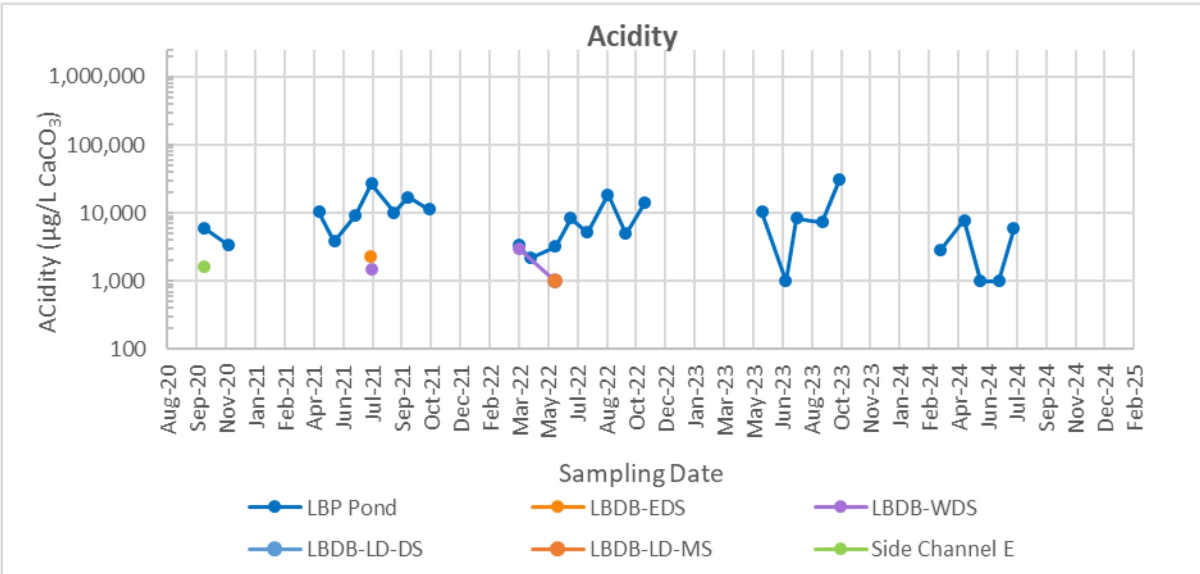


Figure 36: Sulphate at LBDB Locations

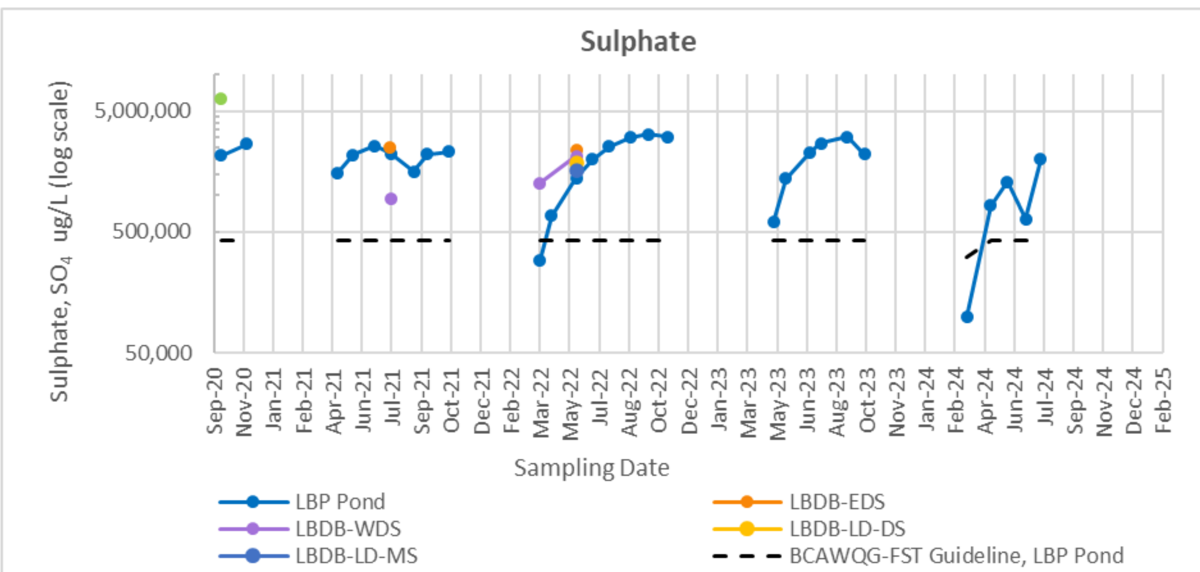


Figure 37a: Total Dissolved Solids (TDS) at LBDB Locations

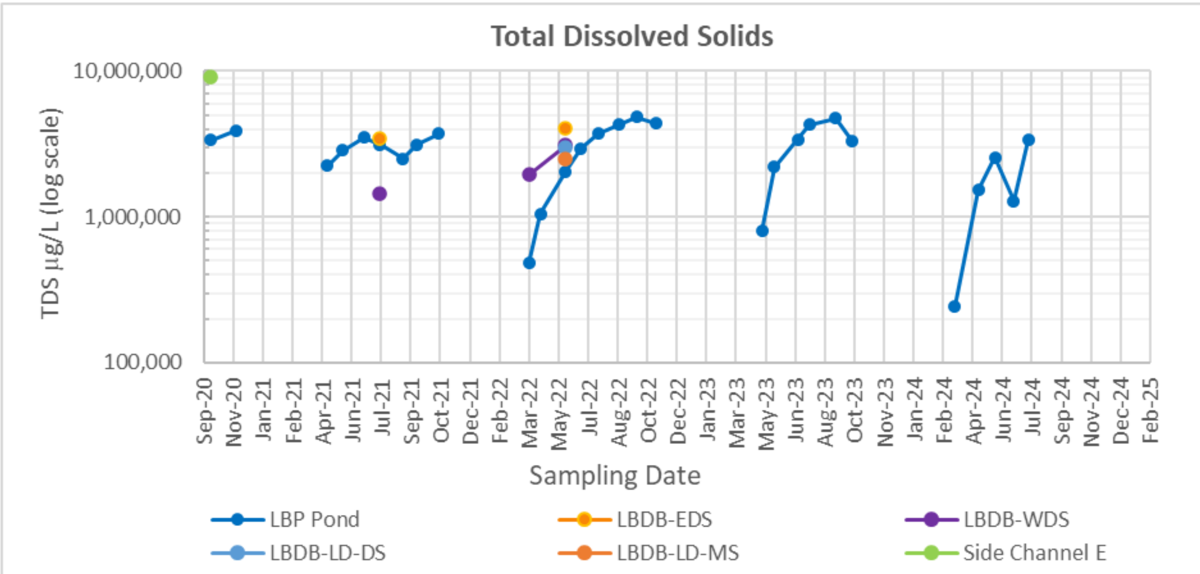


Figure 37b: Total Suspended Solids (TSS) at LBDB Locations

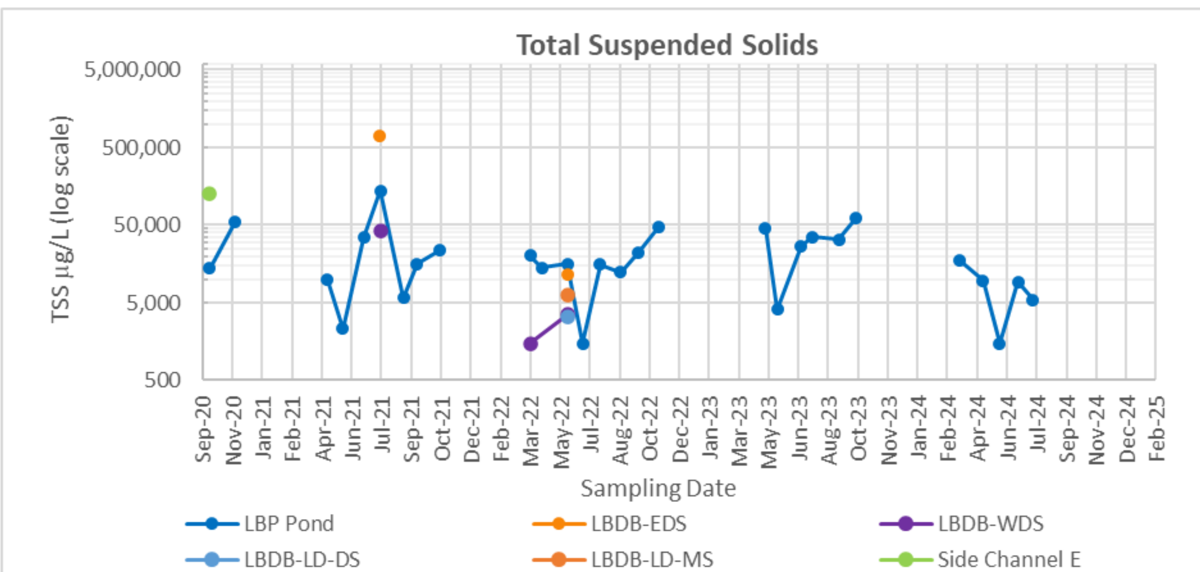


Figure 38a: Total Aluminum at LBDB Locations

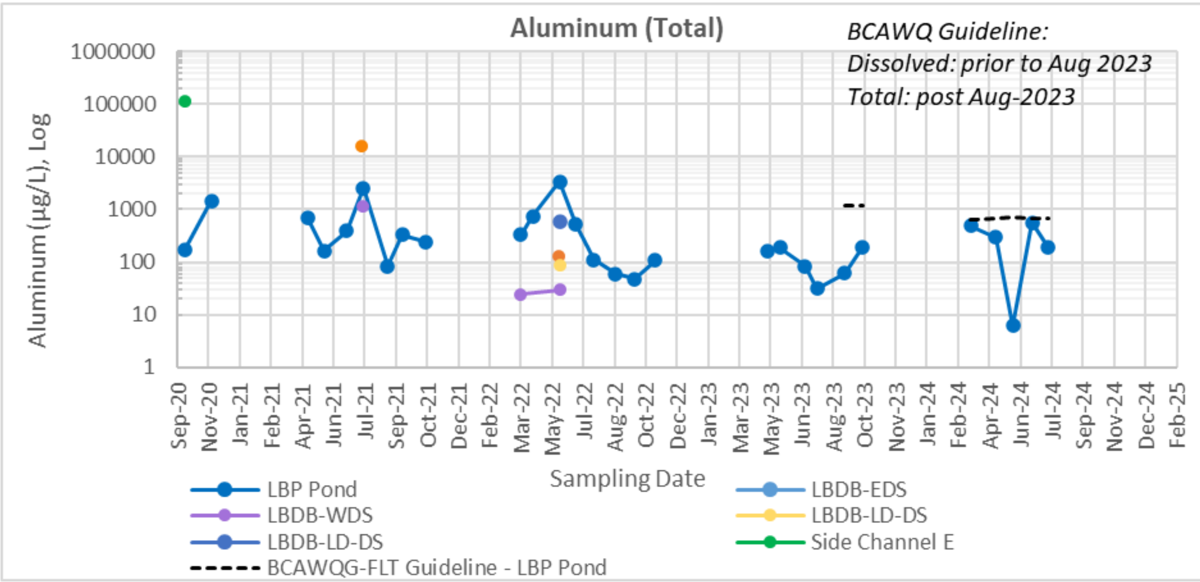


Figure 38b: Dissolved Aluminum at LBDB Locations

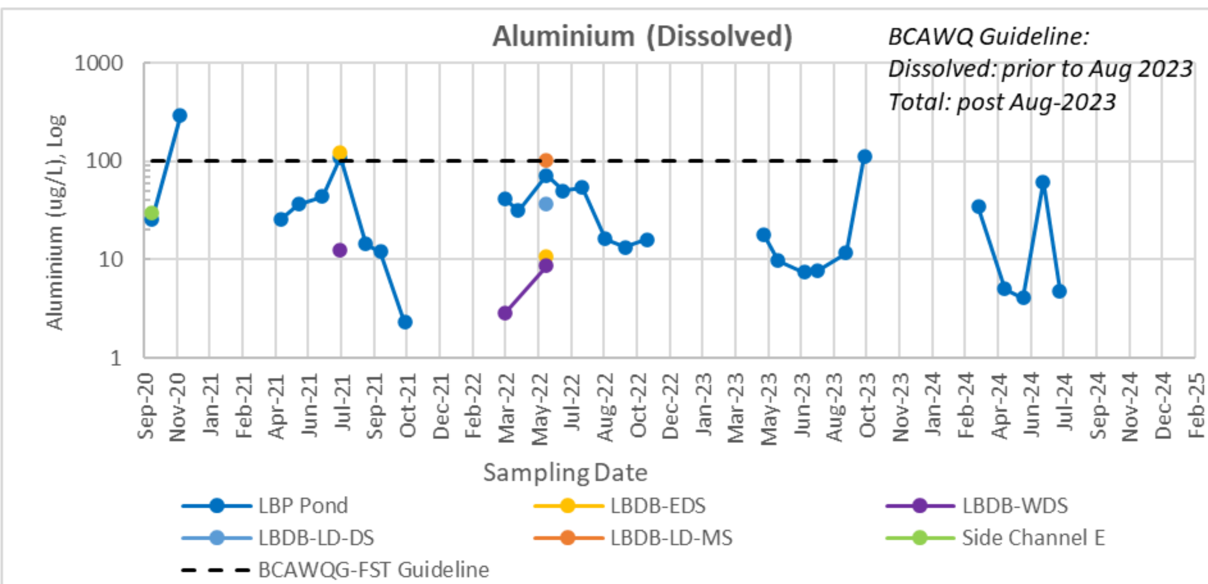


Figure 39a: Total Iron at LBDB Locations

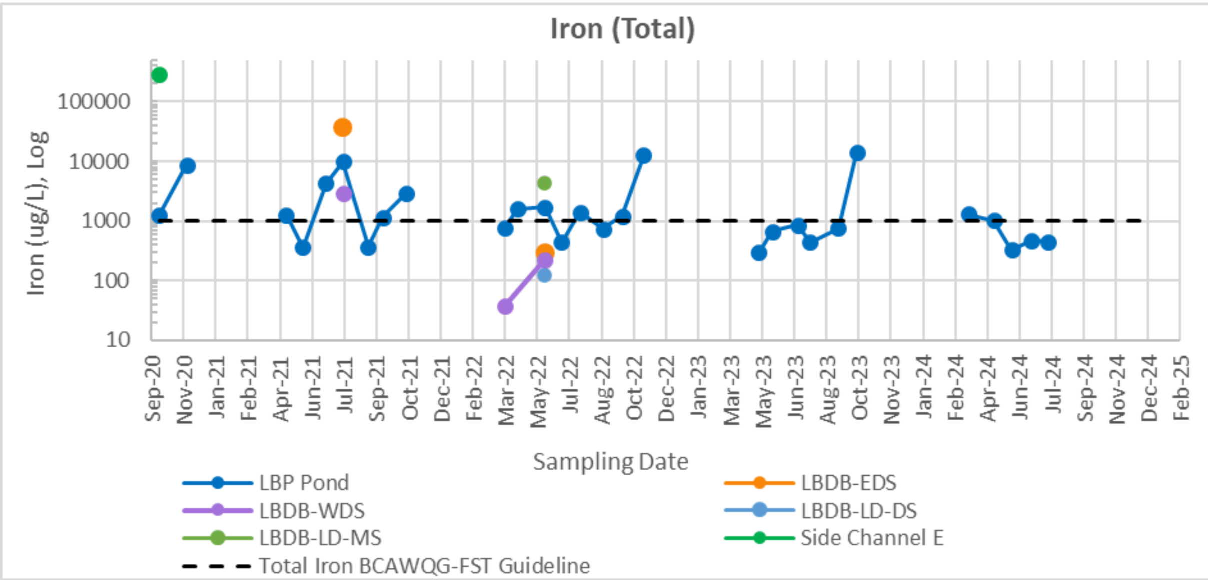


Figure 39b: Dissolved Iron at LBDB Locations

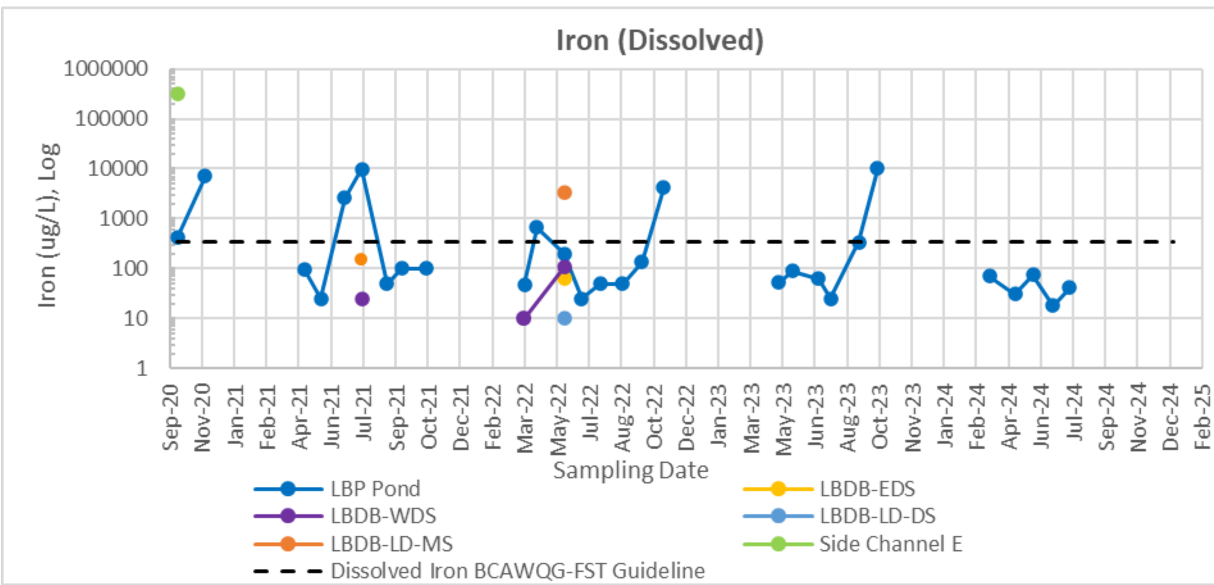


Figure 40: Total Arsenic at LBDB Locations

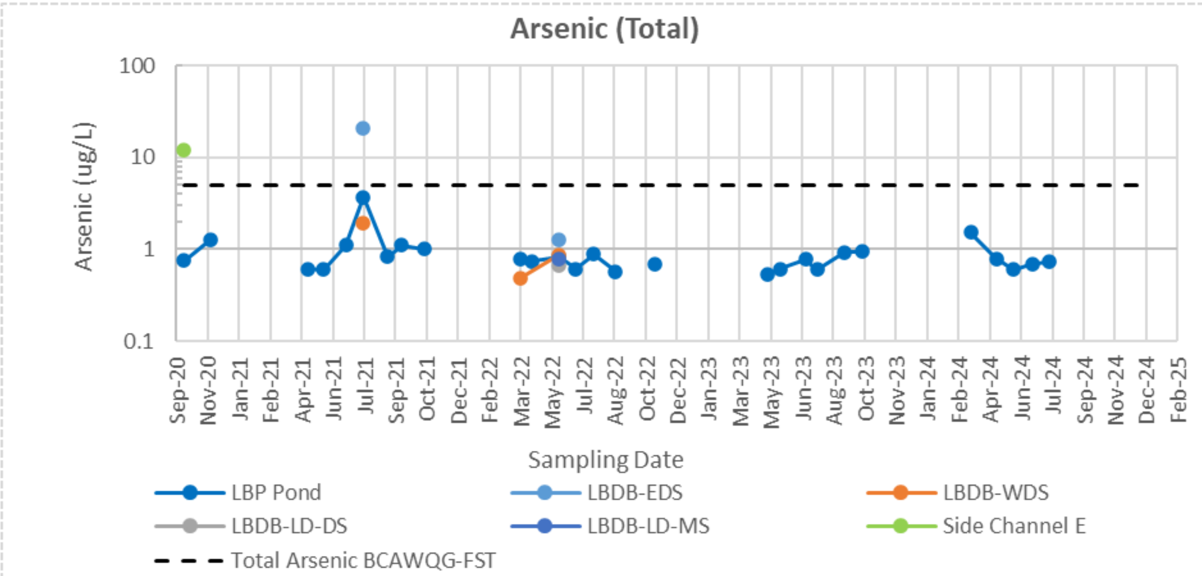


Figure 41: Dissolved Cadmium at LBDB Locations

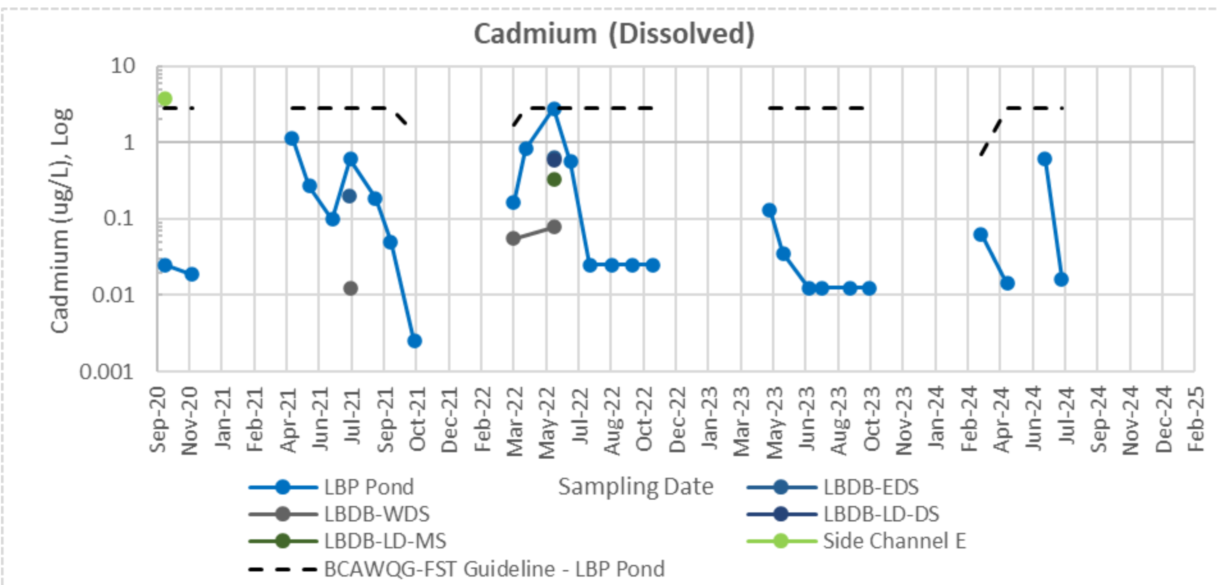


Figure 42: Total Cobalt at LBDB Locations

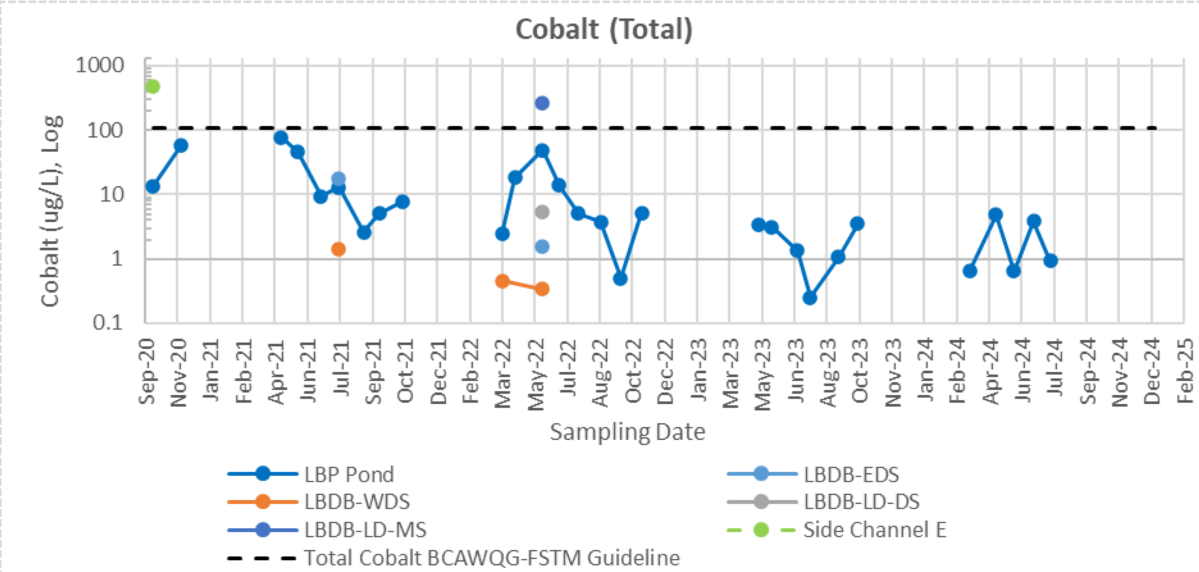


Figure 43: Dissolved Copper at LBDB Locations

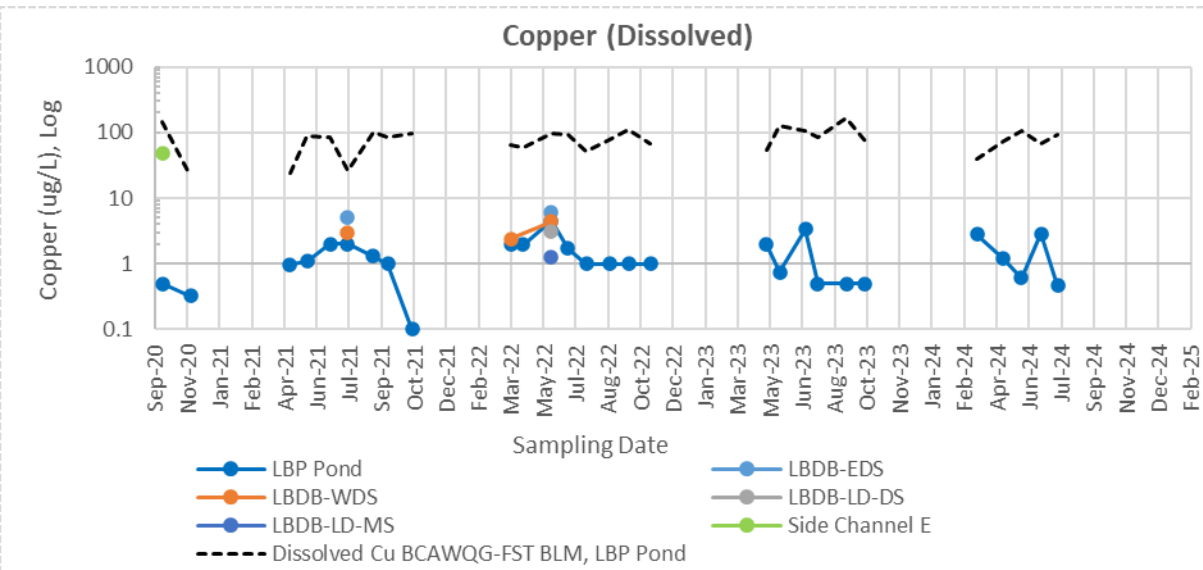


Figure 44a: Total Zinc at LBDB Locations

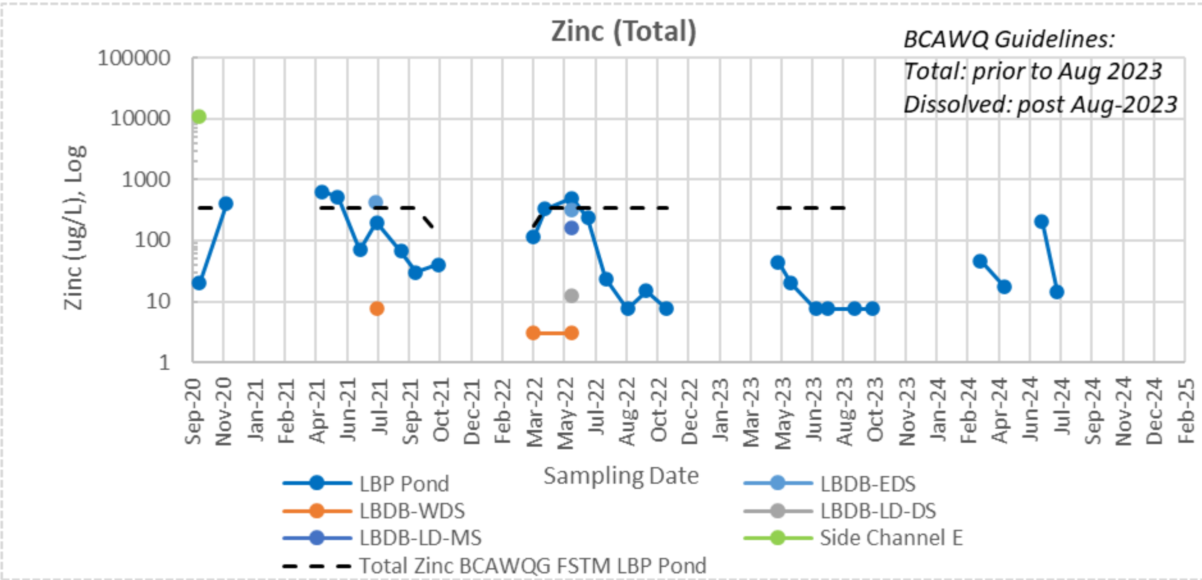
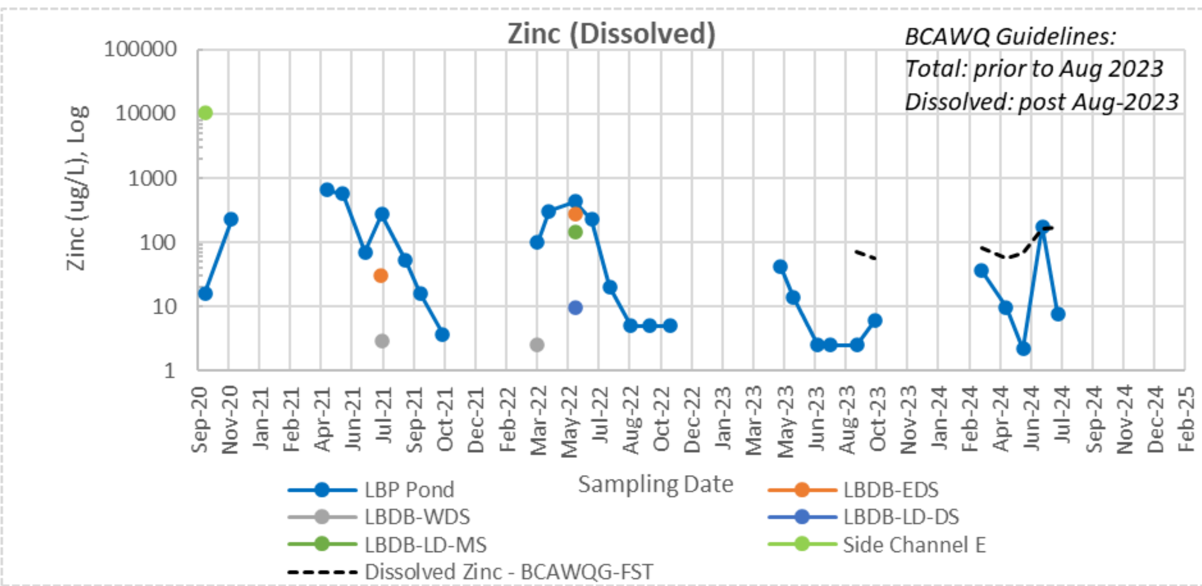


Figure 44b: Dissolved Zinc at LBDB Locations



TABLES

Table 1: Water Sampling Locations and In Situ and Lab Events

		Routine Memo Number:			1						2						3						4									
		Sampling Event Number:			1		2		3		4				5		6				7		8		9		10		11		12	
Catchment	Sample Site	UTM Coordinates Zone 10 (NAD83)		Elevation	21-Jan-24		27-Feb-24		19/Mar/24		28-Apr-24		23-May-24		26-May-24		26-Jun-24		2-Jul-24		21-Jul-24		28-Aug-24		25-Sep-24		27-Oct-24		24-Nov-24		20-Dec-2024	
		Easting	Northing		In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab	In-Situ	Lab
Right Bank - South Bank Initial Access Road	RBSBIAR-US	630327	6228397	468.0																												
	RBSBIAR-DS	630320	6228645	445.2					✓	✓	✓	✓			✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓				
	RBSBIAR-EUS	630376	6228399	464.6							✓	✓									✓	✓	✓	✓	✓	✓	✓	✓				
	RBSBIAR-EDS	630370	6228635	437.4													✓	✓														
Left Bank River Road	LBRR-DD*	632853	6229862	422.0																												
	LBRR-EDP	632715	6229832	416.4					✓								✓	✓														
	LBRR-LC	632856	6229899	427.2																												
	LBRR-UC	633018	6230253	463.2					✓																				✓			
	LBRR-12+500	632914	6229921	432																												
	LBRR-12+600	632948	6229983	436																												
	LBRR-12+700	632992	6230078	443																												
	LBRR-12+810	633039	6230195	454																												
	LBRR-12+920	633000	6230282	463							✓				✓		✓				✓		✓		✓		✓					
	RR8*	632262	6229624	412																												
	RR9*	632460	6229680	413																												
Left Bank Debris Boom	LBP Pond	628227	6231885	458					✓	✓	✓	✓			✓	✓	✓	✓			✓	✓										
	LBDB-WUS	628189	6231933	-																												
	LBDB-WDS	627969	6231883	-																												
	LBDB-EUS	628202	6231908	-																												
	LBDB-EDS	627994	6231856	-																												
	LBDB-LD-US	628257	6231876	-																												
	LBDB-LD-MS	628147	6231844	-																												
	LBDB-LD-DS*	628093	6231766	-																												
RBDT	RBDT	630010	6228840	416			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																
	RBDT-Sump	629418	6229144	-	✓	✓									✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Area 21	Area 21-Sump	630260	6228333	482							✓	✓			✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓				

*Discharge Location to Peace River

All elevations are approximate

Table 2: Daily and 7-Day Mean Temperature and Precipitation

Date	Time	Precipitation[1]		Temperature[1]			Summary
Sample Event Date Bolded	Time Period	Precipitation Event	Total (mm)	Mean (°C)	Minimum (°C)	Maximum (°C)	24 Hr and 7 Day Precipitation
January 14-20, 2024	7 days	January 16, 19, 20	4.27	-21.1	-38.0	-13.0	Minimal precipitation (4.27 mm)
January 20, 2024	24 hrs.	Saturday, January 20, 2024	1.08	-14.7	-17.0	-12.9	Minimal precipitation (1.08 mm)
January 21, 2024	**24 hrs.**	**Sunday, January 21, 2024**	**3.70**	**-16.3**	**-17.4**	**-13.0**	**Minimal precipitation (3.70 mm)**
February 20-26, 2024	7 days	February 23-26	8.24	-4.6	-23.4	10.5	Minimal precipitation (8.24 mm)
February 26, 2024	24 hrs.	February 26, 2024	0.41	-20.8	-24.8	-19.1	Minimal precipitation (0.41 mm)
February 27, 2024	**24 hrs.**	**February 27, 2024**	**0.19**	**-22.7**	**-28.9**	**-17.5**	**Minimal precipitation (0.19 mm)**
March 12-18, 2024	7 days	none	0.00	6.1	-3.5	20.4	No precipitation
March 18, 2024	24 hrs.	none	0.00	7.8	2.7	13.0	No precipitation
March 19, 2024	**24 hrs.**	**none**	**0.00**	**-1.5**	**-4.2**	**2.4**	**No precipitation**
April 21-27, 2024	7 days	none	**0.00**	**8.3**	**-1.7**	**16.6**	No precipitation
April 27, 2024	24 hrs.	none	**0.00**	**9.7**	**4.6**	**15.5**	No precipitation
April 28, 2024	**24 hrs.**	**5:00 AM - 24:00 AM**	**11.12**	**7.7**	**4.4**	**11.1**	**Moderate precipitation (11.12 mm)**
May 19-25, 2024	7 days	May 22, 24, 25	3.05	12.7	2.5	21.8	Minimal precipitation (3.05 mm)
May 25, 2024	24 hrs.	8:00 PM	0.79	13.9	6.6	21.7	Minimal precipitation (0.79 mm)
May 26, 2024	**24 hrs.**	**none**	**0.00**	**14.1**	**8.4**	**18.8**	**No precipitation**
June 19-25, 2024	7 days	June 23-24	41.75	17.2	6.8	27.7	Significant precipitation (41.75 mm)
June 25, 2024	24 hrs.	none	0.00	16.0	10.3	20.9	No precipitation
June 26, 2024	**24 hrs.**	**none**	**0.00**	**16.0**	**12.9**	**19.2**	**No precipitation**
July 14-20, 2024	7 days	none	0.00	23.6	9.7	35.5	No precipitation
July 20, 2024	24 hrs.	none	0.00	21.8	13.6	31.1	No precipitation
July 21, 2024	**24 hrs.**	**none**	**0.00**	**25.2**	**17.4**	**32.0**	**No precipitation**
August 21-27, 2024	7 days	August 24, 26	9.22	15.5	6.3	25.5	Minimal precipitation (9.22 mm)
August 27, 2024	24 hrs.	4:00 and 9:00 PM	0.80	11.8	9.3	14.2	Minimum precipitation (0.80 mm)
August 28, 2024	**24 hrs.**	**5:00 AM**	**0.05**	**15.6**	**5.7**	**24.8**	**Minimum precipitation (0.05 mm)**
September 18-24, 2024	7 days	September 18, 20, 22, 23	16.84	12.3	4.3	20.7	Moderate Precipitation (12.3 mm)
September 24, 2024	24 hrs.	none	0.00	15.5	10.3	18.5	No precipitation
September 25, 2024	**24 hrs.**	**none**	**0.00**	**11.6**	**7.8**	**16.0**	**No precipitation**
October 20-26, 2024	7 days	October 20, 26, 2024	1.23	0.4	-7.0	7.4	Minimum precipitation (1.23 mm)
October 26, 2024	24 hrs.	2:00 PM	0.05	-0.4	-1.3	0.7	Minimum precipitation (0.05 mm)
October 27, 2024	**24 hrs.**	**3:00 and 6:00 AM**	**0.94**	**0.3**	**-1.1**	**1.6**	**Minimum precipitation (0.94 mm)**
November 17-23, 2024	7 days	November 16, 17, 19, 22, 23	11.5	-10.6	-16.9	0.7	Moderate precipitation (11.5 mm)
Nvember 23, 2024	24 hrs.	1:00 AM - 24:00 AM (all day)	4.72	-15.8	-16.7	-15.0	Minimal precipitation (4.72 mm)
November 24, 2024	**24 hrs.**	**none**	**0.00**	**-17.8**	**-20.6**	**-14.7**	**No precipitation**
December 12-18, 2024	7 days	December 14, 15, 18	9.85	-15.0	-26.1	0.7	**Minimal precipitation (9.85 mm)**
December 18, 2024	24 hrs.	7:00 AM - 4:00 PM	3.17	-20.3	-21.9	-19.0	**Minimal precipitation (3.17 mm)**
December 19, 2024	**24 hrs.**	**9:00 PM - 24:00 AM**	**2.10**	**-19.2**	**-21.8**	**-17.1**	**Minimal precipitation (2.10 mm)**

[1] BC Ministry of Environment, BC Air quality data: Fort St John North Camp C_Met_60 weather station. https://envistaweb.env.gov.bc.ca/.

Precipitation is relative ranges, from minimum (<10 mm), moderate (10-20 mm), significant (>20 mm)

Table 3: Classification of Flows in Ditch

Sample Event Date Bolded	Time Period	Precipitation Event	Total (mm)	Mean (°C)	24 Hr and 7 Day Precipitation	Classification
January 14-20, 2024	7 days	January 16, 19, 20	4.27	-21.1	Minimal precipitation (4.27 mm)	Regional groundwater flow; frozen conditions.
January 20, 2024	24 hrs.	Saturday, January 20, 2024	1.08	-14.7	Minimal precipitation (1.08 mm)	
January 21, 2024	**24 hrs.**	**Sunday, January 21, 2024**	**3.70**	**-16.3**	**Minimal precipitation (3.70 mm)**	
February 20-26, 2024	7 days	February 23-26	8.24	-4.6	Minimal precipitation (8.24 mm)	Regional groundwater flow; frozen conditions.
February 26, 2024	24 hrs.	February 26, 2024	0.41	-20.8	Minimal precipitation (0.41 mm)	
February 27, 2024	**24 hrs.**	**February 27, 2024**	**0.19**	**-22.7**	**Minimal precipitation (0.19 mm)**	
March 12-18, 2024	7 days	none	0.00	6.1	No precipitation	Regional groundwater flow; slight warming conditions
March 18, 2024	24 hrs.	none	0.00	7.8	No precipitation	
March 19, 2024	**24 hrs.**	**none**	**0.00**	**-1.5**	**No precipitation**	
April 21-27, 2024	7 days	none	**0.00**	**8.3**	No precipitation	Surface runoff and early spring freshet; melting and warming conditions.
April 27, 2024	24 hrs.	none	**0.00**	**9.7**	No precipitation	
April 28, 2024	**24 hrs.**	**5:00 AM - 24:00 AM**	**11.12**	**7.7**	**Moderate precipitation (11.12 mm)**	
May 19-25, 2024	7 days	May 22, 24, 25	3.05	12.7	Minimal precipitation (3.05 mm)	Surface runoff and spring freshet; melting and warming conditions.
May 25, 2024	24 hrs.	8:00 PM	0.79	13.9	Minimal precipitation (0.79 mm)	
May 26, 2024	**24 hrs.**	**none**	**0.00**	**14.1**	**No precipitation**	
June 19-25, 2024	7 days	June 23-24	41.75	17.2	Significant precipitation (41.75 mm)	Late freshet surface runoff, shallow and regional groundwater flow.
June 25, 2024	24 hrs.	none	0.00	16.0	No precipitation	
June 26, 2024	**24 hrs.**	**none**	**0.00**	**16.0**	**No precipitation**	
July 14-20, 2024	7 days	none	0.00	23.6	No precipitation	Shallow or regional groundwater flow; warm temperatures.
July 20, 2024	24 hrs.	none	0.00	21.8	No precipitation	
July 21, 2024	**24 hrs.**	**none**	**0.00**	**25.2**	**No precipitation**	
August 21-27, 2024	7 days	August 24, 26	9.22	15.5	Minimal precipitation (9.22 mm)	Shallow or regional groundwater flow; warm temperatures.
August 27, 2024	24 hrs.	4:00 and 9:00 PM	0.80	11.8	Minimum precipitation (0.80 mm)	
August 28, 2024	**24 hrs.**	**5:00 AM**	**0.05**	**15.6**	**Minimum precipitation (0.05 mm)**	
September 18-24, 2024	7 days	September 18, 20, 22, 23	16.84	12.3	Moderate Precipitation (12.3 mm)	Shallow or regional groundwater flow and surface runoff.
September 24, 2024	24 hrs.	none	0.00	15.5	No precipitation	
September 25, 2024	**24 hrs.**	**none**	**0.00**	**11.6**	**No precipitation**	
October 20-26, 2024	7 days	October 20, 26, 2024	1.23	0.4	Minimum precipitation (1.23 mm)	Shallow or regional groundwater flow; near frozen conditions.
October 26, 2024	24 hrs.	2:00 PM	0.05	-0.4	Minimum precipitation (0.05 mm)	
October 27, 2024	**24 hrs.**	**3:00 and 6:00 AM**	**0.94**	**0.3**	**Minimum precipitation (0.94 mm)**	
November 17-23, 2024	7 days	November 16, 17, 19, 22, 23	11.5	-10.6	Moderate precipitation (11.5 mm)	Regional groundwater flow; frozen conditions.
Nvember 23, 2024	24 hrs.	1:00 AM - 24:00 AM (all day)	**4.72**	-15.8	Minimal precipitation (4.72 mm)	
November 24, 2024	**24 hrs.**	**none**	**0.00**	**-17.8**	**No precipitation**	
December 12-18, 2024	7 days	December 14, 15, 18	9.85	-15.0	**Minimal precipitation (9.85 mm)**	Regional groundwater flow; frozen conditions.
December 18, 2024	24 hrs.	7:00 AM - 4:00 PM	3.17	-20.3	**Minimal precipitation (3.17 mm)**	
December 19, 2024	**24 hrs.**	**9:00 PM - 24:00 AM**	**2.10**	**-19.2**	**Minimal precipitation (2.10 mm)**	

[1] BC Ministry of Environment, BC Air quality data: Fort St John North Camp C_Met_60 weather station. https://envistaweb.env.gov.bc.ca/.
Precipitation is relative ranges, from minimum (<10 mm), moderate (10-20 mm), significant (>20 mm)

Table 4: Daily Mean Turbidity and TSS Measurements with the Peace River 2024

Date	Turbidity (Daily Mean) and TSS Measurements and Calculations Peace River above Moberly River	
Sampling Event Date Bolded	**PAM-PBM Combined**	**PAM-PBM Combined**
	NTU [1]	**TSS [1] (mg/L)**
January 14-20, 2024	5.2	3.7
January 20, 2024	4.0	2.9
January 21, 2024	4.2	3.0
January 22, 2024	4.2	3.0
February 20-26, 2024	4.7	3.3
February 26, 2024	4.2	3.0
February 27, 2024	3.2	2.3
February 28, 2024	3.1	2.2
March 12-18, 2024	9.6	6.8
March 18, 2024	11.1	7.9
March 19, 2024	5.7	4.1
March 20, 2024	3.8	2.7
April 21-27, 2024	7.0	5.0
April 27, 2024	6.9	4.9
April 28, 2024	7.1	5.1
April 29, 2024	15.2	10.8
May 19-25, 2024	14.8	10.5
May 25, 2024	12.9	9.1
May 26, 2024	19.6	13.9
May 27, 2024	43.5	30.9
June 19-25, 2024	75.4	53.5
June 25, 2024	185.4	131.7
June 26, 2024	158.8	112.7
June 27, 2024	138.7	98.5
July 14-20, 2024	13.3	9.4
July 20, 2024	10.3	7.3
July 21, 2024	10.5	7.4
July 22, 2024	10.7	7.6
August 21-27, 2024	10.1	7.2
August 27, 2024	14.3	10.2
August 28, 2024	10.3	7.3
August 29, 2024	7.3	5.2
September 18-24, 2024	6.6	6.4
September 24, 2024	9.5	6.8
September 25, 2024	9.0	6.4
September 26, 2024	9.5	6.7
October 20-26, 2024	8.0	5.7
October 26, 2024	9.7	6.9
October 27, 2024	7.6	5.4
October 28, 2024	7.1	5.0
November 17-23, 2024	6.8	4.9
November 23, 2024	6.3	4.5
November 24, 2024	6.0	4.2
November 25, 2024	5.4	3.8
December 12-18, 2024	4.0	2.8
December 18, 2024	3.4	2.4
December 19, 2024	3.2	2.3
December 20, 2024	3.1	2.2

[1] NTU (Nephelometric Turbidity Unit) and TSS (total suspended sediment) data provided by Ecofish Ltd., January 22, 2025.

NTU: to some extent, measures (scattered light at 90 degrees from the incident light beam) how much light reflects for a given amount of particulates dependent upon properties of the particles, e.g. their shape, color, and reflectivity.

Note: 7-day average turbidity values are calculated as the average turbidity measured during the prior seven days to the sampling event.

Table 5a: QAQC - Travel and Field Blanks

Sample ID	Unit	RDL	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank
			21-Jan-24	21-Jan-24	27-Feb-24	27-Feb-24	19-Mar-24	19-Mar-24	28-Apr-24	28-Apr-24	26-May-24	26-May-24	26-Jun-24	26-Jun-24	21-Jul-24	21-Jul-24	28-Aug-24	28-Aug-24	25-Sep-24	25-Sep-24	27-Oct-24	27-Oct-24	24-Nov-24	23-Nov-24	20-Dec-24	20-Dec-24
Physical Parameters			Sample Event: RBDT-SUMP only		Sample Event: RBDT only																		Sample Event: RBDT only		Sample Event: RBDT only	
			No FB or TB		No FB or TB																					
Acidity (as $CaCO_3$)	µg/L	1000					<2000	2000	2700	<2000	2000	<2000	2000	<2000	<2000	<2000	2100	2100	<2000	<2000	2000	2000	2200	2200	2100	2100
Alkalinity (Total as $CaCO_3$)	µg/L	1000					<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Electrical Conductivity (EC)	µS/cm	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
Hardness as $CaCO_3$, dissolved	µg/L	600					0	0	<600		<600		<600		<600	0	<600			<600	<600		<600		<600	
Hardness as $CaCO_3$, from total Ca/Mg	µg/L	600					<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600	<600
pH	pH Units	0.1					5.94	5.54	5.41	5.38	5.33	5.32	5.25	5.28	5.59	5.59	5.48	5.46	5.51	5.62	5.47	5.51	5.43	5.40	5.38	5.33
Total Dissolved Solids (TDS)	µg/L	10000					<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000	<10000
Total Suspended Solids (TSS)	µg/L	3000					<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000	<3000
Alkalinity (Hydroxide as $CaCO_3$)	µg/L	1000					<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000					<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000					<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Anions and Nutrients																										
Ammonia (NH_4 as N)	µg/L	5.0					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	24.8	<5	<5	<5	<5	<5	<5
Chloride (Cl^-)	µg/L	500					<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Nitrate (NO_3^- as N)	µg/L	5.0					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nitrite (NO_2^- as N)	µg/L	1.0					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sulphate (SO_4)	µg/L	300					<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300	<300
Dissolved Organic Carbon (DOC)	µg/L	500					0	0	<500		670		<500		<500		<500			<500	<500		<500		<500	0
Metals, Total																										
Aluminum	µg/L	3.0					<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Antimony	µg/L	0.10					<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
Arsenic	µg/L	0.10					<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
Barium	µg/L	0.10					<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
Beryllium	µg/L	0.10					<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
Bismuth	µg/L	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron	µg/L	10					<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.005					<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	µg/L	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Cesium	µg/L	0.01					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	µg/L	0.10					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.10					<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
Copper	µg/L	0.50					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	µg/L	10					<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Lead	µg/L	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lithium	µg/L	1.0					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Magnesium	µg/L	5.0					<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Manganese	µg/L	0.10					<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
Mercury	µg/L	0.005					<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	µg/L	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	µg/L	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phosphorus	µg/L	50.0					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Potassium	µg/L	50.0					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Rubidium	µg/L	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
Selenium	µg/L	0.05					<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silicon	µg/L	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Silver	µg/L	0.01					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	µg/L	50.0					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Strontium	µg/L	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
Sulfur	µg/L	500					<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Tellurium	µg/L	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
Thallium	µg/L	0.01					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	µg/L	0.10					<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
Tin	µg/L	0.10					<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
Titanium	µg/L	0.30					<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
Tungsten	µg/L	0.10					<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
Uranium	µg/L	0.01					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	µg/L	0.50					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	µg/L	3.0					<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zirconium	µg/L	0.06					<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

TETRA TECH

Table 5a: QAQC - Travel and Field Blanks

Sample ID	Unit	RDL	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Field Blank	Travel Blank	Field Blank	Travel Blank	Field Blank	Travel Blank
			21-Jan-24	21-Jan-24	27-Feb-24	27-Feb-24	19-Mar-24	19-Mar-24	28-Apr-24	28-Apr-24	26-May-24	26-May-24	26-Jun-24	26-Jun-24	21-Jul-24	21-Jul-24	28-Aug-24	28-Aug-24	25-Sep-24	25-Sep-24	27-Oct-24	27-Oct-24	24-Nov-24	23-Nov-24	20-Dec-24	20-Dec-24
Metals, Dissolved																										
Aluminum	µg/L	1.0							3.4		<1		<1		<1		<1			<1	<1		<1		<1	
Antimony	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Arsenic	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Barium	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Beryllium	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Bismuth	µg/L	0.05							<0.05		<0.05		<0.05		<0.05		<0.05			<0.05	<0.05		<0.05		<0.05	
Boron	µg/L	10.0							<10		<10		<10		<10		<10			<10	<10		<10		<10	
Cadmium	µg/L	0.005							<0.005		<0.005		<0.005		<0.005		<0.005			<0.005	<0.005		<0.005		<0.005	
Calcium	µg/L	50.0							<50		<50		<50		<50		<50			<50	<50		<50		<50	
Cesium	µg/L	0.01							<0.01		<0.01		<0.01		<0.01		<0.01			<0.01	<0.01		<0.01		<0.01	
Chromium	µg/L	0.10							<0.5		<0.5		<0.5		<0.5		<0.5			<0.5	<0.5		<0.5		<0.5	
Cobalt	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Copper	µg/L	0.20							<0.2		<0.2		<0.2		<0.2		<0.2			<0.2	<0.2		<0.2		<0.2	
Iron	µg/L	10.0							<10		<10		<10		<10		<10			<10	<10		<10		<10	
Lead	µg/L	0.05							<0.05		<0.05		<0.05		<0.05		<0.05			<0.05	<0.05		<0.05		<0.05	
Lithium	µg/L	1.0							<1		<1		<1		<1		<1			<1	<1		<1		<1	
Magnesium	µg/L	5.0							<5		<5		<5		<5		<5			<5	<5		<5		<5	
Manganese	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Mercury	µg/L	0.005							<0.005		<0.005		<0.005		<0.005		<0.005			<0.005	<0.005		<0.005		<0.005	
Molybdenum	µg/L	0.05							<0.05		<0.05		<0.05		<0.05		0.143			<0.05	<0.05		<0.05		<0.05	
Nickel	µg/L	0.50							<0.5		<0.5		<0.5		<0.5		<0.5			<0.5	<0.5		<0.5		<0.5	
Phosphorus	µg/L	50.0							<50		<50		<50		<50		<50			<50	<50		<50		<50	
Potassium	µg/L	50.0							<50		<50		<50		<50		<50			<50	<50		<50		<50	
Rubidium	µg/L	0.20							<0.2		<0.2		<0.2		<0.2		<0.2			<0.2	<0.2		<0.2		<0.2	
Selenium	µg/L	0.05							<0.05		<0.05		<0.05		<0.05		<0.05			<0.05	<0.05		<0.05		<0.05	
Silicon	µg/L	50.0							<50		<50		<50		<50		<50			<50	<50		<50		<50	
Silver	µg/L	0.01							<0.01		<0.01		<0.01		<0.01		<0.01			<0.01	<0.01		<0.01		<0.01	
Sodium	µg/L	50.0							<50		<50		<50		<50		<50			<50	<50		<50		<50	
Strontium	µg/L	0.2							<0.2		<0.2		<0.2		<0.2		<0.2			<0.2	<0.2		<0.2		<0.2	
Sulfur	µg/L	500							<500		<500		<500		<500		<500			<500	<500		<500		<500	
Tellurium	µg/L	0.20							<0.2		<0.2		<0.2		<0.2		<0.2			<0.2	<0.2		<0.2		<0.2	
Thallium	µg/L	0.01							<0.01		<0.01		<0.01		<0.01		<0.01			<0.01	<0.01		<0.01		<0.01	
Thorium	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Tin	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Titanium	µg/L	0.30							<0.3		<0.3		<0.3		<0.3		<0.3			<0.3	<0.3		<0.3		<0.3	
Tungsten	µg/L	0.10							<0.1		<0.1		<0.1		<0.1		<0.1			<0.1	<0.1		<0.1		<0.1	
Uranium	µg/L	0.01							<0.01		<0.01		<0.01		<0.01		<0.01			<0.01	<0.01		<0.01		<0.01	
Vanadium	µg/L	0.50							<0.5		<0.5		<0.5		<0.5		<0.5			<0.5	<0.5		<0.5		<0.5	
Zinc	µg/L	1.0							<1		<1		<1		<1		<1			<1	<1		<1		<1	
Zirconium	µg/L	0.06							<0.2		<0.2		<0.2		<0.2		<0.2			<0.2	<0.2		<0.2			
Laboratory Work Order Number					FJ2400509	FJ2400509	FJ2400814	FJ2400814	FJ2401175	FJ2401175	FJ2401445	FJ2401445	FJ2401851	FJ2401851	FJ2402107	FJ2402107	FJ2402608	FJ2402608	FJ2402937	FJ2402937	FJ2403297	FJ2403297	FJ2403564	FJ2403564	FJ2403869	FJ2403869

RDL - Reportable detection limit
RPD - Relative percent difference calculated as (ABS[(difference between two values)]/((sum of two values/2))*100
Blank indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results is less than detection limits or within 5 times the RDL.
Shaded gray only - exceeds BCAWQG-FSTM guideline.
Blank - not analyzed.

Table 5b: 2024 Quality Assurance/Quality Control for Water Quality Sample Results - Field Replicate Samples

Parameter	Unit	RDL	21-Jan-24		RPD %	27-Feb-24		RPD %	RBSBIAR-DS 19-Mar-24	RBSBIAR-DS-R 19-Mar-24	RPD%	RBSBIAR-DS 28-Apr-24	RBSBIAR-DS-$ 28-Apr-24	RPD %	Area 21-Sump 26-May-24	Area 21-Sump-R 26-May-24	RPD %
Physical Parameters			Sample Event: RBDT-SUMP only			Sample Event: RBDT only											
			No Field Replicate			No Field Replicate											
Acidity (as $CaCO_3$)	µg/L	2000							487000	667000	31.2	<2000	<2000	-	<2000	<2000	-
Alkalinity (Total as $CaCO_3$)	µg/L	1000.0							<1000	<1000	-	196000	196000	0.00	59000	58800	0.34
Electrical Conductivity (EC)	µS/cm	2.0							2960	3030	2.34	1240	1240	0.00	751	773	2.89
Hardness as $CaCO_3$, dissolved	µg/L	600							1310000	1320000	0.76	365000	370000	1.36	347000	344000	0.87
Hardness as $CaCO_3$, from total Ca/Mg	µg/L	600							1300000	1320000	1.53	376000	374000	0.53	377000	379000	0.53
pH	pH Units	0.1							3.10	3.09	0.32	8.27	8.26	0.12	7.92	7.93	0.13
Total Dissolved Solids (TDS)	µg/L	10000							2800000	2620000	6.64	849000	881000	3.70	562000	548000	2.52
Total Suspended Solids (TSS)	µg/L	3000							166000	174000	4.71	12600	37400	99.2	4200	3400	21.1
Alkalinity (Hydroxide as $CaCO_3$)	µg/L	1000							<1000	<1000	-	<1000	<1000	-	<1000	<1000	-
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000							<1000	<1000	-	2200	<1000	75.0	<1000	<1000	-
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000							<1000	<1000	-	194000	196000	1.03	59000	58800	0.34
Anions and Nutrients																	
Ammonia (NH_4 as N)	µg/L	5.0							336	302	10.7	354	356	0.56	11.2	9.7	14.4
Chloride (Cl^-)	µg/L	500							55000	54000	1.83	48300	48400	0.21	13400	13400	0
Nitrate (NO_3^- as N)	µg/L	5.0							246	242	1.64	529	526	0.57	<25	<25	-
Nitrite (NO_2^- as N)	µg/L	1.0							<20	<20	-	13	11.7	10.5	<5	<5	-
Sulphate (SO_4)	µg/L	300							1760000	1730000	1.72	377000	378000	0.26	312000	312000	0
Dissolved Organic Carbon (DOC)	µg/L								2460	2510	2.01	1000	1400	33.3	10900	11100	1.82
Metals, Total																	
Aluminum	µg/L	3.0							53800	54300	0.93	237	521	74.9	204	190	7.11
Antimony	µg/L	0.10							<0.5	<0.5	-	0.3	0.31	3.28	3.44	3.49	1.44
Arsenic	µg/L	0.10							59.8	61.3	2.48	0.5	1.01	67.5	1.59	1.55	2.55
Barium	µg/L	0.10							34	34	0.00	28.7	49.7	53.6	178	183	2.77
Beryllium	µg/L	0.10							14.8	14.4	2.74	<0.1	<0.1	-	<0.1	<0.1	-
Bismuth	µg/L	0.05							<0.25	<0.25	-	<0.05	<0.05	-	<0.05	<0.05	-
Boron	µg/L	10							146	146	0.00	224	231	3.08	40	41	2.47
Cadmium	µg/L	0.005							39.3	40.6	3.25	0.356	0.417	15.8	<0.02	<0.02	-
Calcium	µg/L	50							208000	209000	0.48	98100	97800	0.31	112000	112000	0
Cesium	µg/L	0.01							0.057	0.056	1.77	0.072	0.143	66.0	0.028	0.024	15.4
Chromium	µg/L	0.10							32.8	34.1	3.89	<0.5	0.69	31.9	4.44	4.31	2.97
Cobalt	µg/L	0.10							809	832	2.80	4.42	4.99	12.1	0.19	0.18	5.41
Copper	µg/L	0.50							776	793	2.17	2.55	4.72	59.7	4.6	4.5	2.20
Iron	µg/L	10							90300	93000	2.95	508	1410	94.1	142	110	25.4
Lead	µg/L	0.05							<0.25	0.419	50.5	0.136	0.472	110.5	0.091	0.08	12.9
Lithium	µg/L	1.0							521	513	1.55	59.5	59.2	0.51	8.9	8.9	0
Magnesium	µg/L	5.0							189000	193000	2.09	31800	31600	0.63	23700	24100	1.67
Manganese	µg/L	0.10							6960	7070	1.57	74.9	84.4	11.9	8.12	7.6	6.62
Mercury	µg/L	0.005							0.0078	0.006	26.1	<0.005	<0.005	-	<0.005	<0.005	-
Molybdenum	µg/L	0.05							0.6	0.6	0.00	2.24	2.29	2.21	11.9	12.3	3.31
Nickel	µg/L	0.5							2410	2470	2.46	25.6	27.9	8.60	1.88	1.85	1.61
Phosphorus	µg/L	50.0							5170	5160	0.19	<50	103	69.3	<50	<50	-
Potassium	µg/L	50.0							4650	4740	1.92	3550	3640	2.50	4830	4750	1.67
Rubidium	µg/L	0.2							4.76	4.58	3.85	2.44	3.05	22.2	1.64	1.54	6.29
Selenium	µg/L	0.05							8.72	8.27	5.30	0.892	0.932	4.39	6.07	6.03	0.66
Silicon	µg/L	100							8130	8150	0.25	3160	3330	5.24	350	340	2.90
Silver	µg/L	0.01							<0.05	<0.05	-	<0.01	<0.01	-	0.01	0.011	9.52
Sodium	µg/L	50.0							63800	65100	2.02	127000	128000	0.78	20400	20000	1.98
Strontium	µg/L	0.2							920	916	0.44	737	754	2.28	651	657	0.92
Sulfur	µg/L	500							648000	672000	3.64	136000	138000	1.46	114000	116000	1.74
Tellurium	µg/L	0.2							<1	<1	-	<0.2	<0.2	-	<0.2	<0.2	-
Thallium	µg/L	0.01							<0.05	<0.05	-	0.018	0.025	32.6	0.014	0.014	0.00
Thorium	µg/L	0.10							105	107	1.89	<0.2	<0.5	-	<0.1	<0.1	-
Tin	µg/L	0.10							<0.5	<0.5	-	<0.1	<0.1	-	<0.1	<0.1	-
Titanium	µg/L	0.30							<1.8	<1.8	-	<2.1	<4.8	-	2.73	2.57	6.04
Tungsten	µg/L	0.10							<0.5	<0.5	-	<0.1	<0.1	-	0.32	0.31	3.17
Uranium	µg/L	0.01							63.7	65.2	2.33	1.66	1.72	3.55	2.63	2.6	1.15
Vanadium	µg/L	0.50							<2.5	<2.5	-	<0.5	1.07	72.6	0.65	0.54	18.5
Zinc	µg/L	3.0							8540	8730	2.20	40.6	62.7	42.8	<3	<3	-
Zirconium	µg/L	0.06							<1	<1	-	<0.2	<0.2	-	0.47	<0.2	80.6
Metals, Dissolved																	
Aluminum	µg/L	1.0							51500	51800	0.58	58.8	61.8	4.98	112	111	0.90
Antimony	µg/L	0.10							<0.5	<0.5	-	0.27	0.28	3.64	3.24	3.24	0.00
Arsenic	µg/L	0.10							21.4	21.4	0.00	0.2	0.19	5.13	1.58	1.49	5.86
Barium	µg/L	0.10							30.1	31.4	4.23	19.8	20	1.01	183	181	1.10
Beryllium	µg/L	0.10							14.1	14.2	0.71	<0.1	<0.1	-	<0.1	<0.1	-
Bismuth	µg/L	0.05							<0.25	<0.25	-	<0.05	<0.05	-	<0.05	<0.05	-
Boron	µg/L	10.0							139	143	2.84	214	215	0.47	39	38	2.60
Cadmium	µg/L	0.005							40.5	41.3	1.96	0.274	0.287	4.63	<0.015	0.0088	52.1
Calcium	µg/L	50.0							214000	219000	2.31	95400	97200	1.87	103000	103000	0.00
Cesium	µg/L	0.01							<0.05	<0.05	-	0.041	0.042	2.41	<0.01	<0.01	-
Chromium	µg/L	0.10							28.1	28	0.36	<0.5	<0.5	-	4.37	4.26	2.55
Cobalt	µg/L	0.10							888	894	0.67	3.9	3.97	1.78	0.13	0.13	0.00
Copper	µg/L	0.20							802	805	0.37	0.84	0.85	1.18	4.41	4.2	4.88
Iron	µg/L	10.0							54000	54300	0.55	<10	<10	-	<10	<10	-
Lead	µg/L	0.05							<0.25	<0.25	-	<0.05	<0.05	-	<0.05	<0.05	-
Lithium	µg/L	1.0							518	520	0.39	60.3	60.2	0.17	8.6	8.4	2.35
Magnesium	µg/L	5.0							189000	187000	1.06	30900	31000	0.32	21800	21200	2.79
Manganese	µg/L	0.10							6940	7060	1.71	69	69.3	0.43	2.17	2	8.15
Mercury	µg/L	0.005							<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-
Molybdenum	µg/L	0.05							<0.25	<0.25	-	2.24	2.23	0.45	10.9	11.1	1.82
Nickel	µg/L	0.50							2500	2440	2.43	22.8	23.1	1.31	1.65	1.56	5.61
Phosphorus	µg/L	50.0							1130	1180	4.33	<50	<50	-	<50	<50	-
Potassium	µg/L	50.0							4890	4930	0.81	3500	3580	2.26	4870	4680	3.98
Rubidium	µg/L	0.20							4.9	4.73	3.53	2.08	2.12	1.90	1.49	1.53	2.65

Parameter	RBSBIAR-DS 26-Jun-24	RBSBIAR-DS-R 26-Jun-24	RPD %	RBDT 21-Jul-24	RBDT-R 21-Jul-24	RPD %	RBDT 28-Aug-24	RBDT-R 28-Aug-24	RPD %	RBSBIAR-DS 25-Sep-24	RBSBIAR-DS-R 25-Sep-24	RPD %	Area 21-SUMP 27-Oct-24	Area 21-SUMP-R 27-Oct-24	RPD %	RBDT 24-Nov-24	RBDT-R 24-Nov-24	RPD %	RBDT 20-Dec-24	RBDT-R 20-Dec-24	RPD %
Physical Parameters																Sample Event: RBDT only			Sample Event: RBDT only		
Acidity (as $CaCO_3$)	1080000	1190000	9.69	<2000	<2000	-	<2000	<2000	-	2100	<2000	4.88	2800	2500	11.3	<2000	<2000	-	<2000	<2000	-
Alkalinity (Total as $CaCO_3$)	<1000	<1000	-	158000	160000	1.26	326000	327000	0.31	143000	141000	1.41	53900	53300	1.12	357000	358000	0.28	333000	334000	0.30
Electrical Conductivity (EC)	4300	4310	0.23	784	778	0.77	1810	1800	0.55	1500	1480	1.34	957	966	0.94	1740	1740	0.00	1540	1550	0.65
Hardness as $CaCO_3$, dissolved	1710000	1720000	0.58	87100	87100	0.00	22300	22500	0.89	657000	634000	3.56	417000	416000	0.24	16400	16300	0.61	18000	18200	1.10
Hardness as $CaCO_3$, from total Ca/Mg	1740000	1710000	1.74	89300	86700	2.95	24800	24700	0.40	647000	658000	1.69	450000	466000	3.49	16800	16700	0.60	19600	20200	3.02
pH	2.68	2.69	0.37	8.79	8.72	0.80	9.35	9.35	0.00	8.03	8.02	0.12	7.90	7.90	0.00	9.76	9.76	0.00	9.72	9.72	0.00
Total Dissolved Solids (TDS)	5080000	5400000	6.11	456000	474000	3.87	1090000	1150000	5.36	1120000	1080000	3.64	696000	710000	1.99	1050000	1050000	0.00	850000	834000	1.90
Total Suspended Solids (TSS)	500000	521000	4.11	33200	17400	62.5	<3000	<3000	-	65800	58200	12.3	<3000	<3000	-	<3000	<3000	-	<3000	<3000	-
Alkalinity (Hydroxide as $CaCO_3$)	<1000	<1000	-	<1000	<1000	-	<1000	<1000	-	<1000	<1000	-	<1000	<1000	-	<1000	<1000	-	<1000	<1000	-
Alkalinity (Carbonate as $CaCO_3$)	<1000	<1000	-	13800	13400	2.94	83800	84600	0.95	<1000	<1000	-	<1000	<1000	-	169000	173000	2.34	151000	149000	1.33
Alkalinity (Bicarbonate as $CaCO_3$)	<1000	<1000	-	145000	146000	0.69	242000	243000	0.41	143000	141000	1.41	53900	53300	1.12	188000	185000	1.61	182000	184000	1.09
Anions and Nutrients																					
Ammonia (NH_4 as N)	854	868	1.63	115	115	0.00	247	249	0.81	694	685	1.31	51	41.6	20.3	369	356	3.59	331	333	0.60
Chloride (Cl^-)	84000	79400	5.63	99900	101000	1.10	284000	280000	1.42	79400	79200	0.25	30500	29300	4.01	256000	254000	0.78	228000	226000	0.88
Nitrate (NO_3^- as N)	208	200	3.92	451	436	3.38	1300	1270	2.33	61.8	69	11.0	53	87.4	49.0	1510	1500	0.66	1310	1280	2.32
Nitrite (NO_2^- as N)	<20	<20	-	38.6	37.6	2.62	84	85	1.18	<5	<5	-	<5	<5	-	196	204	4.00	206	203	1.47
Sulphate (SO_4)	2880000	2710000	6.08	74200	74600	0.54	134000	132000	1.50	579000	577000	0.35	413000	396000	4.20	110000	108000	1.83	97700	96400	1.34
Dissolved Organic Carbon (DOC)	5380	3870	32.6	2290	2970	25.9	3270	3490	6.51	730	770	5.33	5710	6150	7.42	2580	2940	13.0	2200	2210	0.45
Metals, Total																					
Aluminum	88300	84700	4.16	896	920	2.64	1020	990	2.99	4700	4720	0.42	105	71	38.6	1600	1610	0.62	1500	1560	3.92
Antimony	<0.5	<0.5	-	1.02	1.01	0.99	1.91	1.97	3.09	<0.1	<0.1	-	2.01	2.06	2.46	2.57	2.57	0.00	2.16	2.2	1.83
Arsenic	144	137	4.98	2.41	2.48	2.86	5.78	5.65	2.27	2.26	2.24	0.89	0.75	0.7	6.90	7.01	7.04	0.43	5.99	6.36	5.99
Barium	37.5	37.8	0.80	99.4	98.3	1.11	113	112	0.89	37.2	35.8	3.84	70.7	70.2	0.71	111	111	0.00	102	107	4.78
Beryllium	28.3	27.4	3.23	<0.1	<0.1	-	<0.1	<0.1	-	1.31	1.38	5.20	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Bismuth	<0.25	<0.25	-	<0.05	<0.05	-	<0.1	<0.1	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.1	<0.1	-	<0.05	<0.05	-
Boron	265	261	1.52	130	126	3.13	373	381	2.12	253	253	0.00	53	54	1.87	368	348	5.59	336	343	2.06
Cadmium	58.8	59.2	0.68	0.104	0.132	23.7	<0.04	<0.04	-	2.61	2.66	1.90	0.0222	0.0211	5.08	<0.02	<0.025	-	<0.02	<0.02	-
Calcium	283000	280000	1.07	25200	24400	3.23	6440	6430	0.16	163000	167000	2.42	135000	139000	2.92	4470	4420	1.12	5300	5460	2.97
Cesium	0.125	0.102	20.26	0.104	0.115	10.0	0.072	0.068	5.71	0.053	0.054	1.87	0.019	0.013	37.5	0.08	0.082	2.47	0.059	0.066	11.2
Chromium	82.9	81.4	1.83	2.08	1.79	15.0	1.14	1.1	3.57	3.28	3.2	2.47	0.71	0.69	2.86	1.38	1.3	5.97	1.17	1.19	1.69
Cobalt	1020	1020	0.00	2.36	2.72	14.2	0.26	0.24	8.00	60.4	59.8	1.00	0.1	<0.1	0.00	<0.2	<0.2	-	<0.1	0.12	18.2
Copper	1380	1420	2.86	5.33	6.11	13.6	3.4	3.31	2.68	55.6	55.4	0.36	2.08	2.14	2.84	3.28	3.23	1.54	2.55	2.71	6.08
Iron	372000	371000	0.27	1970	2080	5.43	150	103	37.2	21100	20700	1.91	119	71	50.5	81	87	7.14	71	71	0.00
Lead	0.818	0.832	1.70	0.456	0.501	9.40	0.23	0.219	4.90	<0.05	<0.05	-	0.064	<0.05	24.6	0.367	0.367	0.00	0.305	0.308	0.98
Lithium	744	717	3.70	36.5	34.8	4.77	89	89.3	0.34	93.4	95.8	2.54	7.9	8.2	3.73	84.5	82.4	2.52	79.1	81.4	2.87
Magnesium	250000	245000	2.02	6400	6250	2.37	2120	2090	1.43	58200	58500	0.51	27400	29000	5.67	1380	1380	0.00	1550	1600	3.17
Manganese	8160	8120	0.49	73	73	0.00	4.19	3.15	28.3	810	799	1.37	3.1	2.32	28.8	1.3	1.36	4.51	1.12	1.13	0.89
Mercury	0.0172	0.0185	7.28	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-
Molybdenum	1.9	1.79	5.96	24.1	23.7	1.67	67.9	69.5	2.33	1.09	1.09	0.00	10.8	11	1.83	45	43.7	2.93	32.2	33.3	3.36
Nickel	3150	3260	3.43	6.96	7.1	1.99	1.36	1.31	3.75	200	200	0.00	1.91	1.85	3.19	<1	<1	-	0.76	0.81	6.37
Phosphorus	17000	16000	6.06	54	<50	7.69	<100	<100	-	236	268	12.7	<50	<50	-	<100	<100	-	81	94	14.86
Potassium	5310	5200	2.09	4040	3890	3.78	6750	6760	0.15	3850	3880	0.78	4820	5070	5.06	7220	7280	0.83	6180	6350	2.71
Rubidium	11.1	10.8	2.74	4.81	4.96	3.07	8.62	8.52	1.17	3.18	3.12	1.90	1.16	1.18	1.71	8.09	8.3	2.56	7.2	6.99	2.96
Selenium	8.34	8.22	1.45	0.751	0.706	6.18	1.21	1.31	7.94	0.306	0.328	6.94	3.89	4.08	4.77	1.31	1.36	3.75	1.2	1.27	5.67
Silicon	19500	18600	4.72	4280	4160	2.84	6070	6020	0.83	6680	6550	1.97	220	190	14.6	7390	7540	2.01	6950	7030	1.14
Silver	0.087	0.075	14.81	0.041	0.021	64.5	<0.02	<0.02	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.02	0.021	4.88	0.016	0.018	11.76
Sodium	86800	87600	0.92	139000	136000	2.18	379000	385000	1.57	73400	75000	2.16	31300	32400	3.45	371000	370000	0.27	324000	332000	2.44
Strontium	1820	1760	3.35	144	145	0.69	110	111	0.90	1030	1040	0.97	620	638	2.86	108	104	3.77	93.4	97.1	3.88
Sulfur	1060000	1050000	0.95	27400	25700	6.40	47700	48200	1.04	215000	212000	1.41	161000	158000	1.88	38400	38300	0.26	33700	34700	2.92
Tellurium	<1	<1	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-
Thallium	0.103	0.098	4.98	0.015	0.016	6.45	<0.02	<0.02	-	0.019	0.02	5.13	<0.01	<0.01	-	<0.02	<0.02	-	<0.01	<0.01	-
Thorium	260	254	2.33	0.1	0.11	9.52	<0.2	<0.2	-	5.56	5.75	3.36	<0.1	<0.1	-	<0.2	<0.2	-	<0.1	<0.1	-
Tin	<0.5	<0.5	-	0.5	0.54	7.69	0.79	0.81	2.50	<0.1	<0.1	-	<0.1	<0.1	-	0.3	0.32	6.45	0.23	0.21	9.09
Titanium	<2.7	<2.4	-	9.84	11	11.1	1.7	1.2	34.5	0.7	0.69	1.44	3.44	<1.5	78.5	2.78	2.91	4.57	2.21	1.85	17.73
Tungsten	<0.5	<0.5	-	1.74	1.73	0.58	4.26	4.23	0.71	<0.1	<0.1	-	0.11	0.11	0.00	3.58	3.58	0.00	2.76	2.76	0.00
Uranium	105	104	0.96	0.714	0.712	0.28	0.565	0.563	0.35	3.33	3.39	1.79	1.91	1.93	1.04	0.602	0.611	1.48	0.56	0.555	0.90
Vanadium	27.2	25.6	6.06	5.57	5.59	0.36	11.6	11.5	0.87	0.94	0.91	3.24	<0.5	<0.5	-	13.2	13.2	0.00	11	11.3	2.69
Zinc	12900	12700	1.56	115	153	28.4	<6	<6	-	667	671	0.60	<3	<3	-	<6	<6	-	3.9	4.2	7.41
Zirconium	<1	<1	-	<0.6	<0.6	-	<0.4	<0.4	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-
Metals, Dissolved																					
Aluminum	84000	84900	1.07	379	385	1.57	894	910	1.77	54.4	52.9	2.80	20.1	20	0.50	1500	1520	1.32	1360	1370	0.73
Antimony	<0.5	<0.5	-	0.94	0.95	1.06	1.8	1.8	0.00	<0.1	<0.1	-	1.99	1.96	1.52	2.34	2.32	0.86	1.91	1.88	1.58
Arsenic	86	89.1	3.54	1.9	1.86	2.13	5.62	5.58	0.71	<0.1	0.1	0.00	0.63	0.63	0.00	6.92	7.06	2.00	6.07	5.9	2.84
Barium	36.1	36.3	0.55	67.9	68.2	0.44	96	98.9	2.98	25.8	25.9	0.39	67.2	63.6	5.50	98.4	97.5	0.92	89.4	88.6	0.90
Beryllium	28.2	28.8	2.11	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-
Bismuth	<0.25	<0.25	-	<0.05	<0.05	-	<0.1	<0.1	-	<0.05	<0.05	-	<0.05	<0.05	-	<0.1	<0.1	-	<0.05	<0.05	-
Boron	256	260	1.55	121	115	5.08	414	434	4.72	245	228	7.19	48	50	4.08	378	376	0.53	279	279	0.00
Cadmium	59.3	58.9	0.68	<0.02	<0.02	-	<0.02	<0.02	-	1.07	1.01	5.77	0.017	0.0201	16.7	<0.02	<0.015	-	<0.015	<0.015	-
Calcium	272000	274000	0.73	23800	23800	0.00	5670	5720	0.88	167000	156000	6.81	128000	127000	0.78	4230	4170	1.43	4790	4860	1.45
Cesium	0.115	0.111	3.54	0.025	0.027	7.69	0.054	0.051	5.71	0.049	0.047	4.17	<0.01	<0.01	-	0.044	0.054	20.4	0.04	0.04	0.00
Chromium	75.1	73.8	1.75	<0.5	<0.5	-	<1	<1	-	<0.5	<0.5	-	0.5	<0.5	0.00	<1	<1	-	0.91	0.91	0.00
Cobalt	984	989	0.51	0.55	0.57	3.57	<0.2	<0.2	-	54.2	53.6	1.11	<0.1	<0.1	-	<0.2	<0.2	-	<0.1	<0.1	-
Copper	1340	1340	0.00	0.88	0.94	6.59	2.25	2.28	1.32	2.57	2.51	2.36	1.88	1.88	0.00	2.58	2.62	1.54	2	2.02	1.00
Iron	282000	288000	2.11	20	34	51.9	<20	21	4.88	1420	1360	4.32	<10	<10	-	25	25	0.00	21	22	4.65
Lead	0.645	0.796	21.0	<0.05	<0.05	-	<0.1	<0.1	-	<0.05	<0.05	-	<0.05	<0.05	-	0.206	0.224	8.37	0.169	0.166	1.79
Lithium	706	725	2.66	33.6	33.9	0.89	81.1	80.4	0.87	94.6	92.6	2.14	8.3	8.3	0.00	85.8	86.3	0.58	73	76.2	4.29
Magnesium	250000	251000	0.40	6730	6730	0.00	1980	1990	0.50	58200	59300	1.87	23600	24000	1.68	1430	1420	0.70	1480	1480	0.00
Manganese	7880	8040	2.01	42.4	42.6	0.47	1.75	1.79	2.26	768	773	0.65	1.18	1.26	6.56	0.6	0.66	9.52	0.49	0.49	0.00
Mercury	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-	<0.005	<0.005	-
Molybdenum	0.817	0.859	5.01	23.9	23.8	0.42	65.5	65.4	0.15	0.922	0.915	0.76	10.8	10.6	1.87	39.5	39.2	0.76	29.6	29.2	1.36
Nickel	3120	3120	0.00	3.32	3.39	2.09	1.06	1.02	3.85	173	175	1.15	1.63	1.65	1.22	<1	<1	-	0.65	0.6	8.00
Phosphorus	9680	9750	0.72	<50	<50	-	<100	<100	-	<50	<50	-	<50	<50	-	113	<100	12.2	85	68	22.2
Potassium	5140	5220	1.54	3940	3920	0.51	6820	6780	0.59	3770	3790	0.53	4770	4670	2.12	7190	7230	0.55	6340	6340	0.00
Rubidium	9.47	9.71	2.50	4.78	4.84	1.25	8.03	8.02	0.12	2.92	3.09	5.66	1.07	1.12	4.57	7.56	7.37	2.55	6.73	6.54	2.86

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Table 5b: 2024 Quality Assurance/Quality Control for Water Quality Sample Results - Field Replicate Samples

Parameter	Unit	RDL			RPD %			RPD %	RBSBIAR-DS	RBSBIAR-DS-R	RPD%	RBSBIAR-DS	RBSBIAR-DS-$	RPD %	Area 21-Sump	Area 21-Sump-R	RPD %
			21-Jan-24			27-Feb-24			19-Mar-24	19-Mar-24		28-Apr-24	28-Apr-24		26-May-24	26-May-24	
Selenium	µg/L	0.05							8.33	7.96	4.54	0.914	0.953	4.18	6.02	6.06	0.66
Silicon	µg/L	50.0							7440	7340	1.35	2760	2800	1.44	104	114	9.17
Silver	µg/L	0.01							<0.05	<0.05	-	<0.01	<0.01	-	<0.01	<0.01	-
Sodium	µg/L	50.0							64200	65000	1.24	126000	129000	2.35	19700	19100	3.09
Strontium	µg/L	0.2							909	904	0.55	720	721	0.14	582	588	1.03
Sulfur	µg/L	500							602000	610000	1.32	137000	137000	0.00	105000	107000	1.89
Tellurium	µg/L	0.20							<1	<1	-	<0.2	<0.2	-	<0.2	<0.2	-
Thallium	µg/L	0.01							<0.05	<0.05	-	0.014	0.013	7.41	<0.01	<0.01	-
Thorium	µg/L	0.10							89.8	91.2	1.55	<0.1	<0.1	-	<0.1	<0.1	-
Tin	µg/L	0.10							<0.5	<0.5	-	<0.1	<0.1	-	<0.1	<0.1	-
Titanium	µg/L	0.30							<1.5	<1.5	-	<0.3	<0.3	-	<0.6	<0.3	-
Tungsten	µg/L	0.10							<0.5	<0.5	-	<0.1	<0.1	-	0.28	0.27	3.64
Uranium	µg/L	0.01							64.4	64.8	0.62	1.56	1.51	3.26	2.5	2.52	0.80
Vanadium	µg/L	0.50							<2.5	<2.5	-	<0.5	<0.5	-	<0.5	<0.5	-
Zinc	µg/L	1.0							9180	9250	0.76	25.4	25.3	0.39	1.2	1.1	8.70
Zirconium	µg/L	0.06							<1	<1	-	<0.2	<0.2	-	<0.2	<0.2	-
Laboratory Work Order Number									FJ2400814	FJ2400814		FJ2401175	FJ2401175		FJ2401445	FJ2401445	

Parameter	RBSBIAR-DS	RBSBIAR-DS-R	RPD %	RBDT	RBDT-R	RPD %	RBDT	RBDT-R	RPD %	RBSBIAR-DS	RBSBIAR-DS-R	RPD %	Area 21-SUMP	Area 21-SUMP-I	RPD %	RBDT	RBDT-R	RPD %	RBDT	RBDT-R	RPD %
	26-Jun-24	26-Jun-24		21-Jul-24	21-Jul-24		28-Aug-24	28-Aug-24		25-Sep-24	25-Sep-24		27-Oct-24	27-Oct-24		24-Nov-24			20-Dec-24		
Selenium	7.28	6.54	10.7	0.66	0.671	1.65	1.19	1.09	8.77	0.25	0.219	13.2	4.01	4.4	9.27	1.42	1.26	11.9	1.06	1.2	12.4
Silicon	18000	18600	3.28	3210	3280	2.16	5930	5800	2.22	5310	5390	1.50	<50	<50	-	6990	6780	3.05	5610	5810	3.50
Silver	<0.05	<0.05	-	<0.01	<0.01	-	<0.02	<0.02	-	<0.01	<0.01	-	<0.01	<0.01	-	<0.02	<0.02	-	0.011	0.011	0.00
Sodium	82200	82000	0.24	137000	136000	0.73	349000	343000	1.73	74800	74000	1.08	28400	29400	3.46	374000	374000	0.00	306000	306000	0.00
Strontium	1760	1770	0.57	138	134	2.94	106	108	1.87	1060	1030	2.87	584	577	1.21	92.2	91.5	0.76	86.4	82.8	4.26
Sulfur	1050000	1070000	1.89	24900	24700	0.81	46300	46100	0.43	204000	202000	0.99	135000	141000	4.35	36700	36900	0.54	32000	32500	1.55
Tellurium	<1	<1	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-
Thallium	0.093	0.1	7.25	<0.01	<0.01	-	<0.02	<0.02	-	0.02	0.018	10.5	<0.01	<0.01	-	<0.02	<0.02	-	<0.01	<0.01	-
Thorium	238	236	0.84	<0.1	<0.1	-	<0.2	<0.2	-	<0.1	<0.1	-	<0.1	<0.1	-	<0.2	<0.2	-	<0.1	<0.1	-
Tin	<0.5	<0.5	-	0.32	0.32	0.00	0.71	0.73	2.78	<0.1	<0.1	-	<0.1	<0.1	-	0.25	0.28	11.3	0.18	0.17	5.71
Titanium	<1.5	<1.5	-	<0.3	<0.3	-	<0.6	<0.6	-	<0.3	<0.3	-	<0.3	<0.3	-	1	1.26	23.0	1.11	0.97	13.5
Tungsten	<0.5	<0.5	-	1.85	1.9	2.67	4.09	4.11	0.49	<0.1	<0.1	-	0.11	0.11	0.00	3.42	3.54	3.45	2.4	2.37	1.26
Uranium	102	102	0.00	0.525	0.549	4.47	0.517	0.514	0.58	2.14	2.06	3.81	1.73	1.74	0.58	0.553	0.572	3.38	0.516	0.51	1.17
Vanadium	12.6	13.9	9.81	3.56	3.64	2.22	10.7	10.6	0.94	<0.5	<0.5	-	<0.5	<0.5	-	12.4	12.3	0.81	10.2	10	1.98
Zinc	11900	11900	0.00	1.3	1.5	14.3	<2	2.1	4.88	148	146	1.36	<1	1.2	18.2	<2	2.4	18.2	2.3	2.2	4.44
Zirconium	<1	<1	-	<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2		<0.2	<0.2	-	<0.4	<0.4	-	<0.2	<0.2	-
Laboratory Work Order Number	FJ2401851	FJ2401851		FJ2402107	FJ2402107		FJ2402608	FJ2402608		FJ2402937	FJ2402937		FJ2403297	FJ2403297		FJ2403564	FJ2403564		FJ2403869	FJ2403869	

Notes:

RDL - Reportable detection limit

RPD - Relative percent difference calculated as (ABS[(difference between two values)]/((sum of two values/2))*100

Blank indicates RPD not calculated. RPD cannot be calculated if one or more of the analytical results is less than detection limits or within 5 times the RDL.

RPD greater than 30%

Blank - not analyzed.

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Table 6: River Road - In Situ Water Quality Sampling

Sample Site	Date	In-Situ Tests - 2024							
		pH	EC (µS/cm)	Hardness (ppm)	Alkalinity (ppm)	Water Temp (°C)	Estimated Flow (L/sec)	Turbidity	Comments
LBRR-DD [1]									
LBRR-LC									
LBRR-UC	19-Mar-24	8.52	1820	800	180	-0.1	0.05	clear	drainage mostly ice covered with minor flows too low to collect lab sample.
	24-Nov-24	Blind Corner PAG exposure is currently being worked on as part of permanent PAG mitigation. Work is directly downstream of LBRR-UC sampling point.							
LBRR-12+600									
LBRR-12+700									
LBRR-12+810									
LBRR-12+920	28-Apr-24	-	-	800	180		0.10	clear	flow too low to use pH pen. Hardness and alkalinity measured with test strips
	26-May-24	8.16	1712	800	180	17.9	0.15	clear	
	26-Jun-24	7.78	1842	800	240	16.9	0.30	clear	
	21-Jul-24	7.96	1872	800	240	18.4	0.08	clear	
	28-Aug-24	8.03	2070	800	180	17.9	0.08	clear	
	25-Sep-24	8.18	2070	800	180	12.0	0.02	clear	
	27-Oct-24	7.77	2160	800	80	1.4	0.05	clear	clear, ditch covered with leaves
RR8 [1]									
RR9 [1]									
LBRR-EDP	19-Mar-24	8.47	3170	800	40	-0.10	0.01	clear	light ice covering surface
	26-Jun-24	7.90	2760	800	180	17.2	0.10	clear	clear with iron/orange stained sediment

[1] Discharge station

Table 7: Summary of Water Quality Exceedances (BCAWQG-FST) Along River Road from Water Sampling Events in 2024

	Sampling Events with Lab Testing	Total Iron (Fe)
LBRR-DD [1]	-	
LBRR-EDP	26-Jun-24	✓
RR8 [1]	-	
RR9 [1]	-	
LBRR-UC	-	
LBRR-LC	-	

[1] **Discharge station**

British Columbia Ministry of Environment, Water Protection & Sustainability Branch. 2023. British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. Referenced Guidelines are for Freshwater Aquatic Life water use and Short Term Maximum (FST) WQG. Exceedances denoted by a check mark.

Table 8: RBSBIAR - In Situ Water Quality Measurements

Sample Site	Date	In-Situ Tests - 2024							
		pH	EC (µS/cm)	Hardness (ppm)	Alkalinity (ppm)	Water Temp (°C)	Estimated Flow (L/sec)	Turbidity	Comments
RBSBIAR-US									
RBSBIAR-DS	19-Mar-24	3.59	2980	450	0	-0.2	0.20	-	visible yellow-tinged flow on top of ice; ditch ice cleaned out within the previous month
	28-Apr-24	8.15	1234	450	180	9.4	0.20	clear	
	26-May-24	8.32	1021	250	240	17.3	0.15	clear	
	26-Jun-24	3.08	4480	0	0	15.7	1.00	orange	orange colour staining in water flow
	21-Jul-24	7.53	1640	800	120	15.4	0.30	orange	orange tinge to water
	28-Aug-24	7.73	1835	800	80	20.5	0.50	clear	clear flows
	25-Sep-24	7.65	1585	800	180	13.5	1.00	orange	orange tinge to water
	27-Oct-24	8.10	1302	450	80	5.2	0.75	clear	
RBSBIAR-EUS	28-Apr-24	7.64	840	450	240	10.9	0.05	clear	flow disappeared 30m downstream
	26-May-24	7.87	831	450	180	18.3	0.05	clear	too low flow for lab sample, in situ only
	26-Jun-24	7.27	917	450	180	18.4	0.10	clear	
	21-Jul-24	7.65	930	450	240	20.0	0.10	clear	
	28-Aug-24	7.89	880	450	180	19.3	0.08	clear	clear flows; vegetation on bottom
	25-Sep-24	8.01	878	450	180	14.2	0.15	clear	clear; bttom of channel covered in vegetation
	27-Oct-24	7.88	817	450	40	4.7	0.20	clear	
RBSBIAR-EDS	26-Jun-24	7.68	3710	800	240	19.1	0.05	orange	iron/orange colour staining in water flow; too low flow for lab sample, in situ only
	24-Nov-24	Suspected to be frozen; the actual sampling point was not visited due to safety reasons with access.							

Table 9: Summary of Water Quality Exceedances (BCAWQG-FST) RBSBIAR from Water Sampling Events in 2024

	Sampling Events with Lab Testing	pH	Total Iron (Fe)	Dissolved Iron (Fe)	Total Aluminum (Al)[3] BCAWQG-FLT (Long-term)	Total Arsenic (As) BCAWQG-FLT (Long-term)	Total Manganese (Mn)	Total Cobalt (Co)	Dissolved Cadmium (Cd)[2]	Dissolved Copper (Cu)	Dissolved Zinc (Zn)[2]
RBSBIAR-US (West ditch; upstream)	-										
RBSBIAR-DS (West ditch; downstream)	19/Mar/24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	28/Apr/24				✓						
	26/May/24										
	26/Jun/24	✓	✓	✓	✓	✓	✓	✓	✓		✓
	21/Jul/24		✓	✓	✓						✓
	28/Aug/24										
	25/Sep/24		✓	✓	✓						✓
	27/Oct/24		✓	✓	✓						✓
RBSBIAR-EUS (East ditch; upstream)	28/Apr/24										
	21/Jul/24										
	28/Aug/24										
	25/Sep/24										
	27/Oct/24										
RBSBIAR-EDS (East ditch; downstream)	26/Jun/24										

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[1]Copper-dissolved guideline is dependant on pH, hardness and Dissolved Organic Carbon

[2] Hardness and DOC-dependent parameters

[3]Calculated guideline is pH dependent for dissolved Aluminum.

Table 10: RBDT - In Situ Water Quality Sampling

Sample Site	Date	In-Situ Tests - 2024							
		pH	EC (μS/cm)	Hardness (ppm)	Alkalinity (ppm)	Water Temp (°C)	Estimated Flow (L/sec)	Turbidity	Comments
RBDT	21/Jan/24	8.66	224	250	80	1.4	n/a	clear	sample taken directly from main line inside tunnel; due to safety concerns, contractor filled 500 mL bottles and in situ tests measured at truck.
	27-Feb-24	9.37	311	250	80	4.8	n/a	clear	sample taken directly from main line inside tunnel; due to safety concerns, contractor filled 500 mL bottles and in situ tests measured at truck.
	19/Mar/24	9.48	317	100	80	6.6	n/a	clear	-
	28/Apr/24	9.65	340	100	180	8.6	n/a	-	sampled from discharge line near tunnel entrance
	23/May/24	8.39	325	-	-	10.2	-	-	NTU 58.4
	26/May/24	8.67	307	100	80	11.3	n/a	clear	sampled from discharge line; 26.33 NTU
	26/Jun/24	no sample collected from RBDT							unable to sample from RBDT discharge valve at tunnel entrance due to reduced flow and sporadic discharge; plan to collect sample from RBDT Sump in upcoming week.
RBDT-Sump	26/May/24	8.75	307	100	80	8.2	n/a	clear	25.05 NTU
	02/Jul/24	9.28	882	100	180	16.2	n/a	clear	sampled from sump inside of RBDT since no flow from RBDT entrance location in the previous week on June 26
	21/Jul/24	9.29	859	100	180	12.8	n/a	clear	sample collected inside tunnel at sump, due to reduced flow at RBDT discharge valve; unknown sheen/surface film on water.
	28/Aug/24	9.88	1865	50	240	14.6	n/a	clear	sampled from sump inside of RBDT
	25/Sep/24	10.01	2160	100	240	12.1	n/a		sample taken from sump
	27/Oct/24	10.07	2160	0	240	8.9	n/a	clear	sample taken from sump
	25/Nov/24	10.08	1429	100	240	9.2	n/a	clear	sampled from sump inside the RBDT
	20/Dec/24	10.44	1717	0	240	8.2	n/a	clear	sampled from sump

Table 11: Summary of Water Quality Exceedances (BCAWQG-FST) at RBDT From Water Sampling Events in 2024

			BCAWQG-FST (Short-term) Guidelines		BCAWQG-FLT (Long-term) Guidelines								
Sample Location	ALS Lab Sample ID	Sampling Dates	pH (>9.0)	Ammonia [2]	Total Iron (Fe)	Total Aluminum (Al)[1]	Total Arsenic (As)	Total Silver (Ag)	Dissolved Copper (Cu)	Dissolved Zinc (Zn)	Nitrite	Chloride	Ammonia[2]
RDBT-Sump	RBDT-Sump	21-Jan-24											
RBDT	RBDT	27-Feb-24				✓							
RBDT	RBDT	19-Mar-24			✓	✓		✓					
RBDT	RBDT	28-Apr-24			✓	✓		✓					✓
RBDT	RBDT	23-May-24			✓	✓							
RBDT	RBDT	26-May-24				✓							
RBDT-Sump	RBDT-Sump	2-Jul-24			✓	✓							
RBDT-Sump	RBDT	21-Jul-24				✓							
RBDT-Sump	RBDT	28-Aug-24	✓			✓	✓		✓			✓	✓
RBDT-Sump	RBDT	25-Sep-24	✓	✓		✓	✓		✓		✓	✓	
RBDT-Sump	RBDT	27-Oct-24	✓			✓	✓		✓			✓	✓
RBDT-Sump	RBDT	23-Nov-24	✓			✓	✓		✓			✓	✓
RBDT-Sump	RBDT	20-Dec-24	✓			✓	✓		✓	✓		✓	✓

British Columbia Ministry of Environment, Water Protection & Sustainability Branch. 2023. British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report.
Referenced Guidelines are for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) WQG. Exceedances denoted by a check mark.

[1]Calculated guideline is pH dependent for dissolved Aluminum.

[2]Ammonia guideline is based on temperature and pH

Table 12: Area 21 Temporary PAG Stockpile and R6 Slope Rinse pH

Date	Sample ID	Rinse pH
30/Apr/24	A21TPAG-1	7.14
30/Apr/24	A21TPAG-2	7.24
30/Apr/24	A21TPAG-3	7.54
30/Apr/24	A21TPAG-4	7.32
30/Apr/24	A21TPAG-5	6.66
30/Apr/24	A21TPAG-6	8.61
30/Apr/24	A21TPAG-7	7.11
30/Apr/24	A21TPAG-8	6.97
30/Apr/24	A21TPAG-9	2.63
30/Apr/24	A21TPAG-10	6.45
26-May-24	R6 Slope 1	3.63
26-May-24	R6 Slope 2	3.64
26-May-24	R6 Slope 3	3.39
26-May-24	R6 Slope 4	3.36
26-May-24	R6 Slope 5	3.54
26-May-24	R6 Slope 6	3.22
1/Oct/24	TA21-1	5.49
1/Oct/24	TA21-2	6.76
1/Oct/24	TA21-3	6.08
1/Oct/24	TA21-4	5.11
1/Oct/24	TA21-5	3.67

Table 13: Area 21 Sump - In Situ Water Quality Sampling

Sample Site	Date	In-Situ Tests - 2024							
		pH	EC (µS/cm)	Hardness (ppm)	Alkalinity (ppm)	Water Temp (°C)	Estimated Flow (L/sec)	Turbidity	Comments
Area 21 Sump	21-Jan-24	frozen/no flow							sump collects runoff from Area 21 PAG stockpile
	27-Feb-24	frozen/no flow							
	19/Mar/24	frozen/no flow							low amount of water in sump; ice covering most of surface
	28/Apr/24	8.37	519	250	80	12.9	n/a		no flow entering the sump
	26/May/24	8.34	744	450	40	20.5	n/a	clear	no flow to sump
	26/Jun/24	7.63	523	250	80	20.1	n/a	mostly clear	mostly clear with slight colour
	21/Jul/24	8.13	846	250	40	20.6	n/a	clear	clear sample, no flow
	28/Aug/24	8.32	1124	450	80	21.5	n/a	clear	no flow, clear, low water level; large PAG rock pile now relocated to Garbage Creek for permanent storage. PAG pad still emplaced however no PAG remains.
	25/Sep/24	8.37	1033	450	40	13.7	n/a		no flow into sump; small amount of PAG remains on pad
	27/Oct/24	7.98	1005	450	40	1.7	n/a	clear	no flow into sump; PAG being added to pad.
	25-Nov-24	frozen/no flow							
	19-Dec-24	frozen/no flow							
	Min	7.63	519	250	40	1.7			
	Max	8.37	1124	450	80	21.5			
	Average	8.16	828	364	57	15.9			
	Median	8.32	846	450	40	20.1			

Table 14: Summary of Water Quality Exceedances (BCAWQG-FST) at the Area 21-Sump From Water Sampling Events in 2024

Sample Location	Sampling Events with Lab Testing	BCAWQG-FST (Short-Term Guidelines)	BCAWQG-FLT (Long-Term Guidelines)
		No Parameters with FST Exceedances	Total and Dissolved Selenium
Area 21-Sump	28-Apr-24		✓
	26-May-24		✓
	26-Jun-24		✓
	21-Jul-24		✓
	28-Aug-24		✓
	25-Sep-24		✓
	27-Oct-24		✓

British Columbia Ministry of Environment, Water Protection & Sustainability Branch. 2023. British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. Referenced Guidelines are for Freshwater Aquatic Life water use and Short Term Maximum (FST) WQG. Exceedances denoted by a check mark.

Table 15: LBDB - In Situ Water Quality Sampling

Sample Site		Date	In-Situ Tests - 2024						
			pH	EC (µS/cm)	Hardness (ppm)	Alkalinity (ppm)	Water Temp (°C)	Estimated Flow (L/s)	Turbidity
Laydown Drainage	LBDB-LD-US	no measurements							
	LB Pond	19-Mar-24	7.63	329	250	40	1.90	n/a	slightly turbid; no flow in or out
		28-Apr-24	7.85	1,700	800	120	12.3	n/a	no flow in or out
		26-May-24	7.44	3,550	800	240	20.1	n/a	clear; no flow in or out
		26-Jun-24	7.27	1,414	250	120	18.6	n/a	slightly turbid
		21-Jul-24	7.27	3,510	800	240	21.9	n/a	clear; no flow in or out
		28-Aug-24	LBDB samples are no longer accessible as the Site C reservoir filling commenced and these areas will be inundated. The area is a "no go zone" due to safety concern						
	LBDB-LD-MS	no measurements							
	LBDB-LD-DS	no measurements							
Upstream Armor Ditch	LBDB-EUS	no measurements							
	LBDB-WUS	no measurements							
Downstream Armor Ditch	LBDB-EDS	no measurements							
	LBDB-WDS	no measurements							

Table 16: Summary of Water Quality Exceedances (BCAWQG-FST) at the Left Bank Debris Boom From Water Sampling Events in 2024

	Sampling Events with Lab Testing	Total Iron (Fe)	Dissolved Zinc (Zn)
LBP Pond	19-Mar-24	✓	
	28-Apr-24	✓	
	26-May-24		
	26-Jun-24		✓
	21-Jul-24		

British Columbia Ministry of Environment, Water Protection & Sustainability Branch. 2023. British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. Referenced Guidelines are for Freshwater Aquatic Life water use and Short Term Maximum (FST) WQG. Exceedances denoted by a check mark.

PHOTOGRAPHS

Photo 1: River Road LBRR-UC location, June 26, 2024.

Photo 2: River Road LBRR-LC location, June 26, 2024.

Photo 3: River Road LBRR-12+920 location, June 26, 2024.

Photo 4: River Road LBRR-DD location, discharge area, June 26, 2024.

Photo 5: River Road LBRR-DD sample collection location, June 26, 2024.

Photo 6: River Road LBRR-EDP end-of-pipe sample location looking upstream, June 26, 2024.

Photo 7: River Road RR8 inlet location, June 26, 2024.

Photo 8: River Road RR9 outlet location, June 26, 2024. Samples are collected from outlet location.

Photo 9: RBSBIAR-US location, looking upstream, June 26, 2024.

Photo 10: RBSBIAR-US location, looking downstream, October 2, 2024.

Photo 11: RBSBIAR-DS location, looking downstream, October 2, 2024.

Photo 12: RBSBIAR-DS location, June 26, 2024.

Photo 13: RBSBIAR-EUS location, looking downstream from the ditch, June 26, 2024.

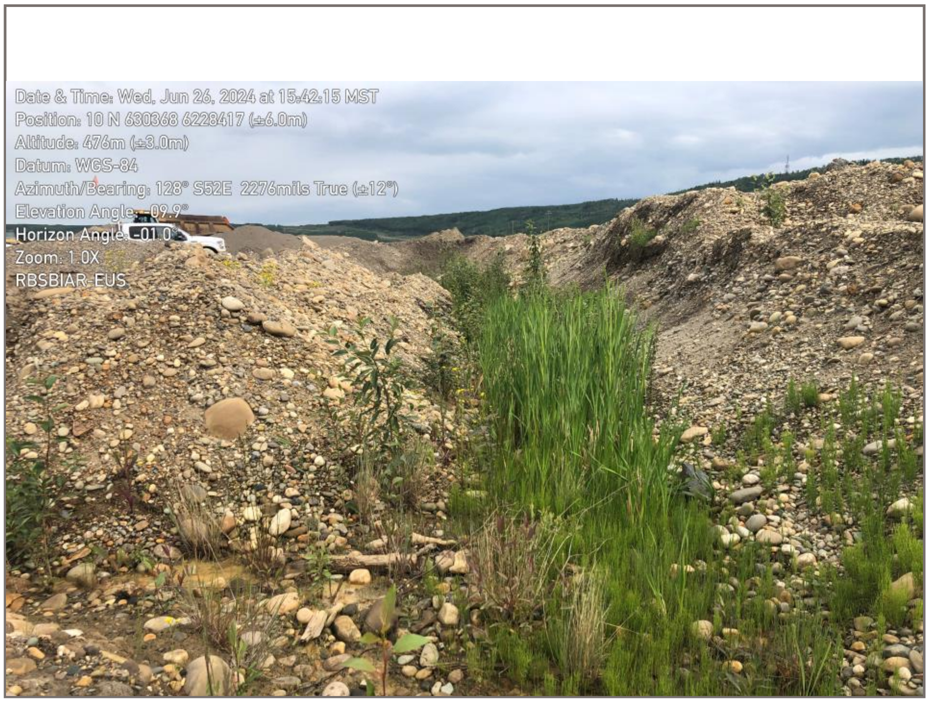

Photo 14: RBSBIAR-EUS location, looking upstream, June 26, 2024.

Photo 15: RBSBIAR-EDS location, June 26, 2024.

Photo 16: RBSBIAR-EDS location, looking upstream, October 2, 2024.

Photo 17: RBDT location, April 28, 2024.

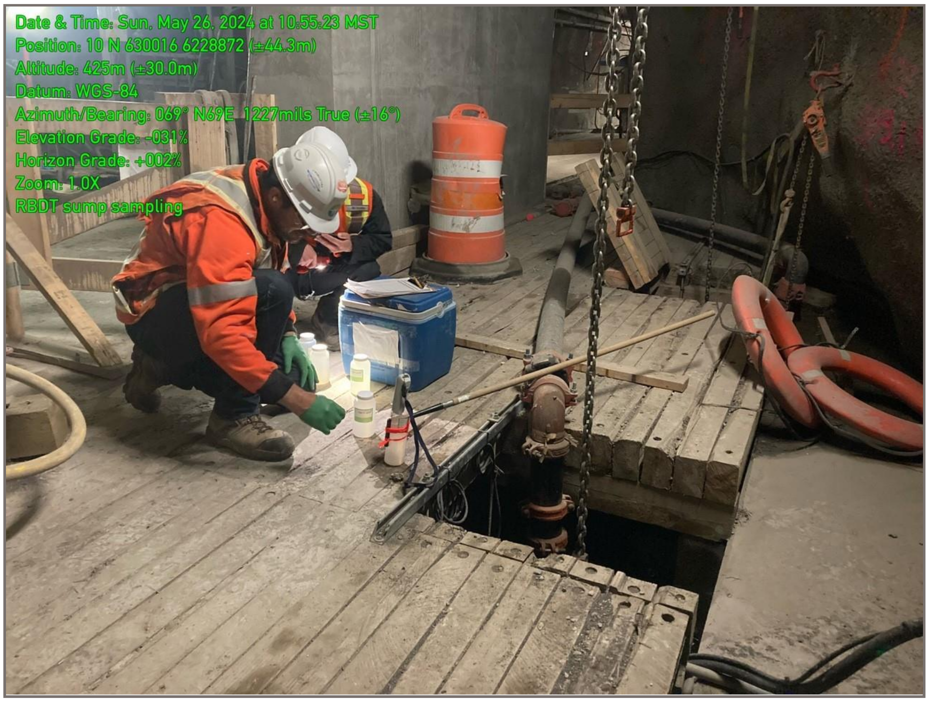

Photo 18: RBDT-Sump sample location, May 26, 2024.

Photo 19: Area 21-Sump sample location, June 26, 2024.

Photo 20: LBP Pond location, June 26, 2024.

Photo 21: LBDB-EUS location, looking upstream, June 26, 2024.

Photo 22: LBDB-EDS location, looking downstream, June 26, 2024.

Photo 23: LBDB-LD-DS location looking upstream, June 26, 2024.

Photo 24: LBDB-LD-MS location looking downstream, June 26, 2024.

Photo 25: LBDB-LD-US location, June 26, 2024.

Photo 26: LBDB-WDS location, June 26, 2024.

Photo 27: LBDB-WUS location, June 26, 2024.

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

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In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

APPENDIX B

SURFACE WATER ANALYTICAL LABORATORY RESULT TABLES

B1 – 2024 Surface Water Laboratory Analytical Results from River Road Monitoring Locations Evaluated against the BCAWQG-FST Guidelines

B2 – 2024 Surface Water Laboratory Analytical Results from SBIAR Monitoring Locations Evaluated against the BCAWQG-FST Guidelines

B3 – 2024 Surface Water Laboratory Analytical Results from RBDT in Powerhouse Area Monitoring Locations Evaluated against the BCAWQG-FST Guidelines

B4 – 2024 Surface Water Laboratory Analytical Results from Area 21-Sump in Powerhouse Area Monitoring Locations Evaluated against the BCAWQG-FST Guidelines

B5 – 2024 Surface Water Laboratory Analytical Results from Left Bank Debris Boom Monitoring Locations Evaluated against the BCAWQG-FST Guidelines

Appendix B1: LBRR Surface Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST [1]	BCAWQG-FLT [2]	LBRR-EDP
					26-Jun-24
Physical Parameters					
Acidity (Total as $CaCO_3$)	µg/L	1000	NG	NG	5100
Alkalinity (Total as $CaCO_3$)	mg/L	1.0	NG	NG	113
Electrical Conductivity (EC)	µS/cm	2.0	NG	NG	2320
Hardness as CaCO3, dissolved	µg/L	500	NG (Acceptable ranges exist when calculating exceedances for Cd, Cu, Pb, Mn, Zn)	NG (Acceptable ranges exist when calculating exceedances for Cd, Cu, Pb, Mn, Zn)	1150000
Hardness as CaCO3, from total Ca/Mg (New January 2020)	µg/L	500			1200000
pH	pH Units	0.10	6.5 - 9	6.5-9.0	7.99
Total Dissolved Solids (TDS)	µg/L	10000	NG	NG	2320000
Total Suspended Solids (TSS)	µg/L	3000	NG	NG	14300
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	1000	NG	NG	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000	NG	NG	<1000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000	NG	NG	113000
Anions and Nutrients (Matrix: Water)					
Ammonia (NH_4 as N)	µg/L	5.0	pH dependent (6.5-9.0)	pH dependent (6.5-9.0)	58
Ammonia FST Guideline	µg/L		pH dependent (at Temp 4 °C or in situ T)		6220
Ammonia FLT Guideline	µg/L			pH dependent (at Temp 4 °C or in situ T)	1200
Chloride (Cl^-)	µg/L	500	600,000	150,000	287000
Nitrate (NO_3^- as N)	µg/L	5.0-100	NG	NG	134
Nitrite (NO_2^- as N)	µg/L	1.0-20	Cl-dependent (> 10,000 µg/L) Guideline: 600 ug/L	Cl-dependent (> 10,000 µg/L) Guideline: 200 ug/L	<20
Sulphate (SO_4) [3]	µg/L	300	NG	309,000 - 429,000	750000
SO4 FLT Guideline Calc	µg/L		NG	Hardness 76,000-180,000 = 309,000 Hardness 181,000-250,000 = 429,000 Hardness > 250,000 site-specific	429000
Dissolved Organic Carbon (DOC)	mg/L	1.0	NG	NG	5.11
Metals, Total					
Aluminum	µg/L	3.00	NG		1020
NEW FLT Guideline (no FST) - relevant August 2023 onwards				pH, DOC, Hardness-dependent; valid hardness 10-430 mg/L, pH 6.0-8.7, DOC 0.8-12.3 mg/L	369
Antimony	µg/L	0.1-0.2	NG	NG	0.28
Arsenic	µg/L	0.10	5, discontinued in Aug 2023	5.0	0.9
Barium	µg/L	0.10	NG	NG	62.8
Beryllium	µg/L	0.10	NG	NG	0.148
Bismuth	µg/L	0.05-0.10	NG	NG	<0.05
Boron	µg/L	10.0	1200	1200	145
Cadmium	µg/L	0.005	NG	NG	0.576
Calcium	µg/L	50	NG	NG	333000
Cesium	µg/L	0.01		NG	0.044
Chromium [4]	µg/L	0.1-0.7	NG	NG	1.41
Cobalt	µg/L	0.10	110	4.0	14.2
Copper [3]	µg/L	0.50	Calc. based on Hardness	2 to 10	5.42
Cu FST Guideline Calc. - relevant prior to August 2019	µg/L		Hardness 13,000 - 400,000 : calc.; Hardness > 400,000 is Capped Value of 400,000		
Cu FLT Guideline Calc. - relevant prior to August 2019	µg/L			Hardness 50,000 - 250,000: calc.; Hardness > 250,000, Cu = 10	
Iron	µg/L	10	1000	NG	**3430**
Lead [3]	µg/L	0.05-0.1	Calc. based on Hardness	Calc. based on Hardness	0.274
Pb FST Guideline Calc (Based on Hardness as CaCO3), applies to water hardness 8000-360,000 µg/L	µg/L		Hardness ≤ 8000 is 3; Hardness 8000-360,000: calc. Hardness>360,000 is Capped Value of 360,000		417
Pb FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Hardness 8000-360,000: calc. Hardness > 360,000 is Capped Value of 360,000	20
Lithium	µg/L	1.0	NG	NG	88
Magnesium	µg/L	5.0	NG	NG	90100
Manganese [3]	µg/L	0.10	Calc. based on hardness	Calc. based on Hardness	346
Mn FST Guideline Calc (Based on Hardness as CaCO3)	µg/L		Hardness 25,000 - 259,000 : calc.; Hardness > 259,000 is Capped Value of 259,000		3394
Mn FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Hardness 37,000 - 450,000: calc.; Hardness > 450,000 is Capped Value of 450,000	2585
Mercury (Based on methyl Hg & total mass Hg)	µg/L	0.005	NG	Calc.	<0.005
Molybdenum	µg/L	0.05	2000	≤ 1000	2.86
Nickel	µg/L	0.5	NG		102
Phosphorus	µg/L	50-100	NG	NG	60
Potassium	µg/L	50.0	NG	NG	11200
Rubidium	µg/L	0.2	NG	NG	4.61

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Appendix B1: LBRR Surface Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST [1]	BCAWQG-FLT [2]	LBRR-EDP
					26-Jun-24
Selenium	µg/L	0.05	NG	2.0	0.993
Silicon	µg/L	100		NG	6320
Silver [3]	µg/L	0.01-0.02	0.10 - 3.0	0.05 - 1.5	<0.01
Ag FST Guideline Calc			Hardness ≤ 100,000 Ag = 0.10 Hardness > 100,000 Ag = 3.0		3.0
Ag FLT Guideline Calc				Hardness ≤ 100,000 Ag = 0.05 Hardness > 100,000 Ag = 1.5	1.5
Sodium	µg/L	50.0	NG	NG	64000
Strontium	µg/L	0.2	NG	NG	2170
Sulfur	µg/L	500	NG	NG	302000
Tellerium	µg/L	0.2-0.4	NG	NG	0.31
Thallium	µg/L	0.01-0.055	NG	NG	0.049
Thorium	µg/L	0.1-0.2	NG	NG	<0.4
Tin	µg/L	0.1-0.2	NG	NG	<0.1
Titanium	µg/L	0.3-1.2	NG	NG	<12.3
Tungsten	µg/L	0.1-0.2	NG	NG	0.1
Uranium	µg/L	0.01	NG	NG	4.39
Vanadium	µg/L	0.5-1.0	NG	NG	1.75
Zinc [3]	µg/L	3.0	Calc. based on Hardness	Calc. based on Hardness	101
Zn FST Guideline Calc. - relevant prior to Aug 2023	µg/L		Hardness < 90,000 = 33.0 Hardness 90,000 - 500,000, Calc. Hardness > 500,000, Capped Value		340.5
Zn FLT Guideline Calc. - relevant prior to Aug 2023	µg/L			Hardness < 90,000 = 7.5 Hardness 90,000 - 330,000, Calc. Hardness > 330,000, Capped Value	187.5
Zirconium	µg/L	0.06-0.12	NG	NG	<0.6
Metals, Dissolved					
Aluminum [5]	µg/L	1.0	100	50	94.4
Al FST Guideline Calc. (based on pH); relevant prior to Aug 2023	µg/L		pH < 6.5 : calc. Al pH ≥ 6.5 : 100.0 Al		100
Al FLT Guideline Calc. (based on median pH); relevant prior to Aug 2023	µg/L			median pH < 6.5 : calc. Al median pH ≥ 6.5 : 50.0 Al	50
Antimony	µg/L	0.1-0.2	NG	NG	0.24
Arsenic	µg/L	0.10	NG	NG	0.17
Barium	µg/L	0.10	NG	NG	50.3
Beryllium	µg/L	0.1-0.2	NG	NG	<0.1
Bismuth	µg/L	0.05-0.1	NG	NG	<0.05
Boron	µg/L	10.0	NG	NG	131
Cadmium [3]	µg/L	0.005	Calc. based on Hardness	Calc. based on hardness	0.356
Cd FST Guideline Calc.	µg/L		Hardness 7,000 - 455,000, Calc. Hardness > 455,000, is Capped Value of 455,000		2.80
Cd FLT Guideline Calc.	µg/L			Hardness 3,400 - 285,000, Calc. Hardness > 285,000, is Capped Value of 285,000	0.46
Calcium	µg/L	50.0	NG	NG	313000
Cesium	µg/L	0.01	NG	NG	0.019
Chromium	µg/L	0.10	NG	NG	<0.5
Cobalt	µg/L	0.10	NG	NG	11.8
Copper [6]	µg/L	0.20	Calc. based on BLM Model	Calc. based on BLM Model	1.77
Cu FST Guideline Value (Acute)	µg/L		BLM Ligand Model value		21.5
Cu FLT Guideline Value (Chronic)	µg/L			BLM Ligand Model value	3.76
Iron	µg/L	10.0-20.0	350	NG	<10
Lead	µg/L	0.05-0.1	NG	NG	<0.05
Lithium	µg/L	1.0	NG	NG	81.2
Magnesium	µg/L	5.0	NG	NG	88500
Manganese	µg/L	0.10	NG	NG	301
Mercury	µg/L	0.005	NG	NG	<0.005
Molybdenum	µg/L	0.05	NG	NG	2.78
Nickel	µg/L	0.50	NG	NG	90.5
Phosphorus	µg/L	50.0-100.0	NG	NG	<50
Potassium	µg/L	50.0	NG	NG	10900
Rubidium	µg/L	0.20	NG	NG	4.12
Selenium	µg/L	0.05	NG	2.0	0.871
Silicon	µg/L	50.0	NG	NG	5040
Silver	µg/L	0.01-0.02	NG	NG	<0.01
Sodium	µg/L	50.0	NG	NG	59200
Strontium	µg/L	0.20	NG	NG	2180
Sulfur	µg/L	500	NG	NG	296000
Tellerium	µg/L	0.2-0.4	NG	NG	<0.2
Thallium	µg/L	0.01	NG	NG	0.046
Thorium	µg/L	0.1-0.2	NG	NG	<0.1
Tin	µg/L	0.1-0.2	NG	NG	<0.1
Titanium	µg/L	0.3-0.6	NG	NG	<0.3
Tungsten	µg/L	0.1-0.2	NG	NG	<0.1
Uranium	µg/L	0.01	NG	NG	4.28
Vanadium	µg/L	0.5-1.0	NG	NG	<0.5
Zinc	µg/L	1.00	NG	NG	23.4
Zn FST Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L		Hardness and DOC-dependent, Capped Value; valid for Hardness 13.8-250.5 mg CaCO3/L, DOC 0.3-17.3 mg/L		125

Appendix B1: LBRR Surface Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST [1]	BCAWQG-FLT [2]	LBRR-EDP
					26-Jun-24
Zn FLT Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L			Hardness and DOC-dependent, Capped Value; valid for Hardness 23.4-399 mg $CaCO_3$/L, pH 6.5-8.13, DOC 0.3-22.9 mg/L)	42.1
Zirconium	µg/L	0.06-0.12	NG	NG	<0.2
Laboratory Work Order Number					FJ2401851

Notes:

Screening completed on BCAWQG-FST [1] and FLT [2] guideline values.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2023). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2019). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2018). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Long Term Average (LT) guidelines.

[3] Guideline is hardness dependant. Where results are above laboratory reportable detection limits, guideline limits have been evaluated based on individual sample hardness. Sample-specific guideline values are listed in parentheses after the laboratory result, where applicable.

[4] Guideline is for Chromium (IV) cation. Analytical results are for unspeciated Chromium. Where analytical results exceed the guideline, speciated analysis may be warranted.

[5] Guideline is pH dependant.

NG - No Guideline

Detection limit can vary as described in the COA. Detection limit can be raised when dilutation is required due to high Dissolved Solids/Electrical Conductivity (DLDS), e.g. nitrite.

BOLD and shaded dark gray: Exceeds BCAWQG-FST (Freshwater Short Term) guideline.

Shaded Light Gray: Exceeds BCAWQG-FLT (Freshwater Long Term) guideline.

RED - Measured value is below detection limit (DL); value shown is 50% of DL

Blank - Not analyzed

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Appendix B2: SBIAR Surface Water Analytical Results

Parameter	Unit	BCAWQG - FST 1	BCAWQG - FLT 2	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-EDS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS
				19-Mar-24	28-Apr-24	26-May-24	26-Jun-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	26-Jun-24	28-Apr-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24
Physical Parameters																	
Acidity (Total as $CaCO_3$)	µg/L	NG	NG	487000	1000	1000	1080000	1000	<2000	2100	5000	4300	7600	4000	3400	2100	5900
Alkalinity (Total as $CaCO_3$)	mg/L	NG	NG	0.5	196	196	0.5	159	97.6	143	194	163	210	234	212	209	199
Electrical Conductivity (EC)	µS/cm	NG	NG	2960	1240	1030	4300	1620	1750	1500000	1210	811	782	859	800	805000	756
Hardness as CaCO3, dissolved	µg/L	NG	NG	1310000	365000	272000	1710000	677000	818000	657000	478000	424000	379000	426000	367000	385000	350000
Hardness as CaCO3, from total Ca/Mg (New January 2020)	µg/L			1300000	376000	292000	1740000	662000	865000	647000	490000	444000	399000	416000	394000	371000	367000
pH	pH Units	6.5 - 9	6.5-9.0	**3.10**	8.27	8.26	**2.68**	7.90	8.13	8.03	8.27	8.01	8.17	8.04	8.15	8.17	8.21
Total Dissolved Solids (TDS)	µg/L	NG	NG	2800000	849000	654000	5080000	1220000	1510000	1120000	822000	720000	524000	592000	562000	535000	498000
Total Suspended Solids (TSS)	µg/L	NG	NG	166000	12600	1500	500000	64800	7300	65800	6000	25500	7000	3600	3500	6600	4600
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	NG	NG	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	NG	NG	<1000	2200	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	NG	NG	<1000	194000	196000	<1000	159000	97600	143000	194000	163000	210000	234000	212000	209000	199000
Anions and Nutrients																	
Ammonia (NH_4 as N)	µg/L	pH dependent (6.5-9.0)	pH dependent (6.5-9.0)	336	354	54.6	854	847	260	694	673	6.5	8.6	11.2	2.5	2.5	2.5
Ammonia FST Guideline	µg/L	pH dependent (at Temp 4 °C or in situ T)		27200	3150	3150	27200	7420	4950	6220	3150	6220	3950	6220	3950	3950	3950
Ammonia FLT Guideline			pH dependent (at Temp 4 °C or in situ T)	1970	606	606	1970	1430	952	1200	606	1200	759	1200	759	759	759
Chloride (Cl^-)	µg/L	600000	150,000	55000	48300	49900	84000	71400	77700	79400	65600	56500	57900	52700	51600	51500	52300
Nitrate (NO_3^- as N)	µg/L	NG	NG	246	529	331	208	190	306	61.8	177	668	1750	547	<25	<25	157
Nitrite (NO_2^- as N)	µg/L	Cl-dependent (> 10,000 µg/L) Guideline: 600 ug/L	Cl-dependent (> 10,000 µg/L) Guideline: 200 ug/L	<20	13	23.7	<20	<10	<10	<5	<5	8.7	<5	<5	<5	<5	<5
Sulphate (SO_4) [3]	µg/L	NG	309,000 - 429,000	1760000	377000	251000	2880000	630000	808000	579000	380000	176000	115000	153000	143000	150000	133000
SO4 FLT Guideline Calc	µg/L	NG	Hardness 76,000-180,000 = 309,000 Hardness 181,000-250,000 = 429,000 Hardness > 250,000 site-specific	429000	429000	429000	429000	429000	429000	429000	429000	309000	309000	309000	309000	429999	309000
Dissolved Organic Carbon (DOC)	mg/L	NG	NG	2.46	1.00	1.18	5.38	0.96	2.29	7.3	0.580	3.96	2.10	2.44	1.96	1.52	1.68
Metals, Total																	
Aluminum	µg/L	NG		53800	237	129	88300	4800	87.9	4700	213	121	25.8	16.7	8.8	3.3	15.8
NEW FLT Guideline (no FST) - relevant August 2023 onwards	µg/L		pH, DOC, Hardness-dependent; valid hardness 10-430 mg/L, pH 6.0-8.7, DOC 0.8-12.3 mg/L	134	141	161	221	122	228	469	97.8	315	220	232	210	178	194
Antimony	µg/L	NG	NG	<0.5	0.3	0.25	<0.5	0.1	0.74	<0.10	<0.1	0.15	0.12	0.14	0.13	0.11	<0.1
Arsenic	µg/L	5, discontinued Aug 2023	5.0	59.8	0.5	0.33	144	1.98	0.4	2.26	0.32	0.28	0.19	0.21	0.22	0.18	0.12
Barium	µg/L	NG	NG	34	28.7	24.3	37.5	34.3	38.9	37.2	22.4	98.6	74.6	103	91.6	90.8	80.7
Beryllium	µg/L	NG	NG	14.8	<0.1	<0.1	28.3	1.76	<0.1	1.31	<0.1	<0.1	<0.1	<0.1	<0.1	<0.100	<0.1
Bismuth	µg/L	NG	NG	<0.25	<0.05	<0.05	<0.25	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Boron	µg/L	1200	1200	146	224	264	265	299	222	253	201	29	16	37	40	33	26
Cadmium	µg/L	NG	NG	39.3	0.356	0.0432	58.8	3.21	0.427	2.61	0.343	0.183	0.038	0.0078	0.0025	0.0225	0.0109
Calcium	µg/L	NG	NG	208000	98100	74700	283000	167000	245000	163000	129000	129000	116000	125000	117000	108000	106000
Cesium	µg/L	NG	NG	0.057	0.072	0.035	0.125	0.071	0.087	0.053	0.05	0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Chromium [4]	µg/L	NG	NG	32.8	<0.5	<0.5	82.9	3.14	<0.5	3.28	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Cobalt	µg/L	110	4.0	**809**	4.42	0.95	**1020**	87.9	15.9	60.4	17.2	2.08	0.19	0.05	0.05	0.05	0.05
Copper [3]	µg/L	Calc. based on Hardness	2 to 10	776	2.55	1.72	1380	60.7	1.92	55.6	2.6	1.7	0.5	0.25	0.25	0.25	0.25
Cu FST Guideline Calc. - relevant prior to August 2019	µg/L	Hardness 13,000 - 400,000 : calc.; Hardness ≥ 400,000 is Capped Value of 400,000															
Cu FLT Guideline Calc. - relevant prior to August 2019	µg/L		Hardness 50,000 - 250,000: calc.; Hardness > 250,000, Cu = 10														
Iron	µg/L	1000	NG	**90300**	508	47	**372000**	**27600**	365	**21100**	**2330**	198	126	46	28	5	29
Lead [3]	µg/L	101 - 348	Calc. based on Hardness	<0.25	0.136	<0.05	0.818	<0.05	<0.05	<0.050	0.072	0.061	<0.05	<0.05	<0.05	<0.050	<0.05
Pb FST Guideline Calc (Based on Hardness as CaCO3), applies to water hardness 8000-360,000 µg/L	µg/L	Based on Hardness 8000-360,000 Hardness ≤ 8000: 3 Hardness > 8000 : calc.		417.0	417.0	291.8	417.0	417.0	417.0	417.0	417.0	416.97	417.0	417.0	417.0	417.0	402.3
Pb FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L		Applies to Hardness 8000-360,000 Hardness ≤ 8000, NG Hardness > 8000 : calc.	19.6	19.6	14.7	19.6	19.6	19.6	19.6	19.6	19.57	19.6	19.6	19.6	19.6	19.0
Lithium	µg/L	NG	NG	521	59.5	58.3	744	120	54.6	93.4	53.5	12.8	6.3	10.6	9.4	8.4	6.6
Magnesium	µg/L	NG	NG	189000	31800	25700	250000	59500	61500	58200	40900	29700	26600	25300	24700	24600	24900
Manganese [3]	µg/L	Calc. based on Hardness	Calc. based on Hardness	**6960**	74.9	11.7	**8160**	1010	437	810	295	105	94.4	10.9	2.85	0.94	3.09
Mn FST Guideline Calc (Based on Hardness as CaCO3)	µg/L	Applies to Hardness 25000-259000 µg/L Mn : calc.		3394	3394	3394	3394	3394	3394	3394	3394	3394.18	3394	3394.2	3394.2	3394.2	3394.2
Mn FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L		Applies to Hardness 37000-450000 µg/L Mn : calc.	2585	2211	1802	2585	2585	2585	2585	2585	2470.6	2273	2479.4	2219.8	2299.0	2145.0
Mercury (Based on methyl Hg & total mass Hg)	µg/L	NG	Calc.	0.0078	<0.005	<0.005	0.0172	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Molybdenum	µg/L	2000	≤ 1000	0.60	2.24	2.75	1.9	1.25	7.4	1.09	1.11	2	1.20	1.15	1.19	1.27	1.19
Nickel	µg/L	NG	NG	2410	25.6	8.59	3150	278	55.8	200	58.1	8.35	1.24	0.76	0.56	<0.50	<0.5

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Appendix B2: SBIAR Surface Water Analytical Results

Parameter	Unit	BCAWQG - FST 1	BCAWQG - FLT 2	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-EDS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS
				19-Mar-24	28-Apr-24	26-May-24	26-Jun-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	26-Jun-24	28-Apr-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24
Phosphorus	µg/L	NG	NG	5170	<50	<50	17000	96	<50	236	<50	<50	<50	<50	<50	<50	<50
Potassium	µg/L	NG	NG	4650	3550	3200	5310	4260	8020	3850	3390	3900	3170	4600	4310	4130	3470
Rubidium	µg/L	NG	NG	4.76	2.44	1.86	11.1	3.36	5.37	3.18	2.5	0.8	0.4	0.78	0.79	0.67	0.52
Selenium	µg/L	NG	2.0	8.72	0.892	0.464	8.34	0.413	2.2	0.306	0.328	0.882	0.895	0.666	0.351	0.331	0.27
Silicon	µg/L	NG	NG	8130	3160	2930	19500	7900	2360	6680	4400	4720	3680	5120	4640	4820	4830
Silver [3] (Based on Hardness < or > 100000)	µg/L	0.10 - 3.0	0.05 - 1.5	<0.05	<0.01	<0.01	0.087	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Ag FST Guideline Calc	µg/L	Hardness ≤ 100,000 Ag = 0.10 Hardness > 100,000 Ag = 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
Ag FLT Guideline Calc	µg/L		Hardness ≤ 100,000 Ag = 0.05 Hardness > 100,000 Ag = 1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Sodium	µg/L	NG	NG	63800	127000	134000	86800	101000	64300	73400	82600	18200	15300	19400	18900	17600	18200
Strontium	µg/L	NG	NG	920	737	669	1820	1260	1840	1030	971	254	207	254	227	238	221
Sulfur	µg/L	NG	NG	648000	136000	96600	1060000	231000	291000	215000	146000	65100	40500	54200	50800	52600	49600
Tellerium	µg/L	NG	NG	<1	<0.2	<0.2	<1	0.21	0.21	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Thallium	µg/L	NG	NG	<0.05	0.018	0.014	0.103	0.026	0.045	0.019	0.014	0.011	<0.01	<0.01	<0.01	<0.010	<0.01
Thorium	µg/L	NG	NG	105	<0.2	<0.1	260	3.59	<0.1	5.56	0.14	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Tin	µg/L	NG	NG	<0.5	<0.1	<0.1	<0.5	<0.1	0.71	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Titanium	µg/L	NG	NG	<1.8	<2.1	0.34	<2.7	<0.6	0.39	0.7	<0.9	1.52	0.68	<0.6	<0.3	<0.30	<0.3
Tungsten	µg/L	NG	NG	<0.5	<0.1	<0.1	<0.5	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Uranium	µg/L	NG	NG	63.7	1.66	1.23	105	2.62	3.44	3.33	0.905	1.64	1.71	1.16	1.1	1.16	1.17
Vanadium	µg/L	NG	NG	<2.5	<0.5	<0.5	27.2	1.65	<0.5	0.94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Zinc [3] (Based on Hardness < or > 90,000)	µg/L	Calc. based on Hardness	Calc. based on Hardness	8540	40.6	5.5	12900	976	49.9	667	100	20.6	1.5	1.5	1.5	1.5	3.6
Zn FST Guideline Calc. - relevant prior to Aug 2023	µg/L	Hardness 90,000 - 500,000, Calc. Hardness > 500,000, is Capped Value of 500,000		341	239	170	341	341	341	341	324	283.5	250	285	241	254	228
Zn FLT Guideline Calc. - relevant prior to Aug 2023			Hardness 90,000 - 330,000, Calc. Hardness > 330,000, is Capped Value of 330,000	188	188	144	188	188	188	188	188	187.5	188	188	188	188	188
Zirconium	µg/L	NG	NG	<1	<0.2	<0.2	<1	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Metals, Dissolved																	
Aluminum [5]	µg/L	100	50	51500	58.8	122	84000	35.6	37.1	54.4	24.4	13.3	2	<1	<1	12.8	<1
Al FST Guideline Calc. (based on pH); relevant prior to Aug 2023	µg/L	pH < 6.5 : calc. Al pH ≥ 6.5 : 100.0 Al		100	100	100	100	100	100	100	100	100	100	100	100	100	100
Al FLT Guideline Calc. (based on median pH); relevant prior to Aug 2023	µg/L		median pH < 6.5 : calc. Al median pH ≥ 6.5 : 50.0 Al	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Antimony	µg/L	NG	NG	<0.5	0.27	0.22	<0.5	<0.1	0.63	<0.10	<0.1	0.15	<0.1	0.13	0.12	0.17	<0.1
Arsenic	µg/L	NG	NG	21.4	0.2	0.32	86	0.12	0.28	<0.10	0.15	0.19	0.12	0.2	0.19	0.17	0.16
Barium	µg/L	NG	NG	30.1	19.8	24.2	36.1	27.1	35.8	25.8	19.3	96.1	75.4	111	94.9	96.6	75.4
Beryllium	µg/L	NG	NG	14.1	<0.1	<0.1	28.2	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Bismuth		NG	NG	<0.25	<0.05	<0.05	<0.25	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Boron	µg/L	NG	NG	139	214	233	256	262	253	245	199	28	15	34	40	32	26
Cadmium [3] (Based on Hardness as $CaCO_3$)	µg/L	Calc. based on Hardness	Calc. based on hardness	**40.5**	0.274	0.0356	**59.3**	1.43	0.417	1.07	0.272	0.168	0.0156	0.0077	0.0025	0.0078	0.0103
Cd FST Guideline Calc.	µg/L	Hardness 7,000 - 455,000, Calc. Hardness > 455,000, is Capped Value of 455,000		2.80	2.23	1.65	2.80	2.80	2.80	2.80	2.80	2.604	2.320	2.617	2.245	2.358	2.138
Cd FLT Guideline Calc.			Hardness 3,400 - 285,000, Calc. Hardness > 285,000, is Capped Value of 285,000	0.46	0.46	0.44	0.46	0.46	0.457	0.457	0.457	0.457	0.457	0.457	0.457	0.457	0.457
Calcium	µg/L	NG	NG	214000	95400	70600	272000	164000	232000	167000	129000	121000	109000	127000	110000	113000	104000
Cesium		NG	NG	<0.05	0.041	0.031	0.115	0.063	0.068	0.049	0.042	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Chromium	µg/L	NG	NG	28.1	<0.5	<0.5	75.1	<0.5	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Cobalt	µg/L	NG	NG	888	3.90	0.92	984	82.7	15.2	54.2	16.6	1.97	0.1	0.05	0.05	0.05	0.05
Copper [6]	µg/L	Calc. based on BLM Model	Calc. based on BLM Model	**802**	0.84	1.54	**1340**	2.94	1.36	2.57	0.770	1.11	0.38	0.36	0.33	0.71	0.32
Cu FST Guideline Value (Acute)	µg/L	BLM Ligand Model value		<0.20	5.56	5.56	0.20	4.04	11.7	32.2	5.560	17.3	10.1	10.8	10.1	7.62	10.1
Cu FLT Guideline Value (Chronic)	µg/L		BLM Ligand Model value	<0.20	0.98	0.98	0.20	0.699	2.05	5.63	0.982	3.01	1.78	1.89	1.78	1.34	1.78
Iron	µg/L	350	NG	**54000**	5.00	13	**282000**	**2520**	40	**1420**	**752**	21	12	5.00	5.00	12	5.00
Lead	µg/L	NG	NG	<0.25	<0.05	<0.05	0.645	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Lithium	µg/L	NG	NG	518	60.3	56.8	706	113	53.6	94.6	58.5	11.6	6.2	10.2	8.8	8.8	7
Magnesium	µg/L	NG	NG	189000	30900	23300	250000	64900	57900	58200	37800	29500	26000	26500	22400	25000	22000
Manganese	µg/L	NG	NG	6940	69	10.7	7880	1070	433	768	291	97.5	34.3	7.9	1.01	4.64	1.7
Mercury	µg/L	NG	NG	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Molybdenum	µg/L	NG	NG	<0.25	2.24	2.46	0.817	0.984	6.4	0.922	1.11	2.09	1.27	1.1	1.12	1.21	1.24
Nickel	µg/L	NG	NG	2500	22.8	8.32	3120	255	53.7	173	54.8	7.94	1.12	0.66	<0.5	0.59	0.54

TETRA TECH

Appendix B2: SBIAR Surface Water Analytical Results

Parameter	Unit	BCAWQG - FST 1	BCAWQG - FLT 2	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-DS	RBSBIAR-EDS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS	RBSBIAR-EUS
				19-Mar-24	28-Apr-24	26-May-24	26-Jun-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	26-Jun-24	28-Apr-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24
Phosphorus	µg/L	NG	NG	1130	<50	<50	9680	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
Potassium	µg/L	NG	NG	4890	3500	3550	5140	4200	7480	3770	3490	3780	3180	4450	4440	4480	3570
Rubidium	µg/L	NG	NG	4.9	2.08	1.92	9.47	3.66	5.26	2.92	2.55	0.7	0.35	0.84	0.81	0.84	0.49
Selenium	µg/L	NG	2.0	8.33	0.914	0.405	7.28	0.369	2.1	0.25	0.313	0.87	0.998	0.55	0.312	0.28	0.356
Silicon	µg/L	NG	NG	7440	2760	2600	18000	5840	2400	5310	3940	4700	3770	4900	4530	4600	4390
Silver	µg/L	NG	NG	<0.05	<0.01	<0.01	<0.05	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Sodium	µg/L	NG	NG	64200	126000	131000	82200	103000	58700	74800	75800	17100	15200	19400	17800	18500	17200
Strontium	µg/L	NG	NG	909	720	588	1760	1200	1690	1060	878	248	197	248	219	241	204
Sulfur	µg/L	NG	NG	602000	137000	83900	1050000	216000	288000	204000	131000	72200	41100	50400	48000	49700	46100
Tellurium	µg/L	NG	NG	<1	<0.2	<0.2	<1	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Thallium	µg/L	NG	NG	<0.05	0.014	<0.01	0.093	0.024	0.044	0.02	0.015	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Thorium	µg/L	NG	NG	89.8	<0.1	<0.1	238	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Tin	µg/L	NG	NG	<0.5	<0.1	<0.1	<0.5	<0.1	0.61	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Titanium	µg/L	NG	NG	<1.5	<0.3	<0.3	<1.5	<0.3	<0.3	<0.30	<0.3	<0.3	<0.3	<0.3	<0.3	<0.30	<0.3
Tungsten	µg/L	NG	NG	<0.5	<0.1	<0.1	<0.5	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Uranium	µg/L	NG	NG	64.4	1.56	1.12	102	1.66	3.21	2.14	0.832	1.57	1.64	1.24	1.03	1.16	1.14
Vanadium	µg/L	NG	NG	<2.5	<0.5	<0.5	12.6	<0.5	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Zinc	µg/L	NG	NG	**9180**	25.4	4.2	**11900**	**303**	45.5	**148**	**76.8**	16.5	1.5	1.1	0.5	21.4	1.2
Zn FST Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L	Hardness and DOC-dependent, Capped Value; valid for Hardness 13.8-250.5 mg CaCO3/L, DOC 0.3-17.3 mg/L		105	18.0	87.7	126	83.4	103	136	73.9	117	101	30.1	99	93.2	95.4
Zn FLT Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L		Hardness and DOC-dependent, Capped Value; valid for Hardness 23.4-399 mg $CaCO_3$/L, pH 6.5-8.13, DOC 0.3-22.9 mg/L)	106	84.3	14.6	145	23.3	27.3	47	15.8	37.4	25.1	104	23.7	22.4	21.3
Zirconium	µg/L	NG	NG	<1	<0.2	<0.2	<1	<0.2	<0.2	<0.20	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Laboratory Work Order Number				FJ2400814	FJ2401175	FJ2401445		FJ2402107	FJ2402608	FJ2402937	FJ2403297		FJ2401175	FJ2402107	FJ2402608	FJ2402937	FJ2403297

Notes:

Screening completed on BCAWQG-FST [1] and FLT [2] guideline values.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2023). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2019). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2018). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Long Term Average (LT) guidelines.

[3] Guideline is hardness dependant. Where results are above laboratory reportable detection limits, guideline limits have been evaluated based on individual sample hardness. Sample-specific guideline values are listed in parentheses after the laboratory result, where applicable.

[4] Guideline is for Chromium (IV) cation. Analytical results are for unspeciated Chromium. Where analytical results exceed the guideline, speciated analysis may be warranted.

[5] Guideline is pH dependant.

NG - No Guideline

Detection limit can vary as described in the COA. Detection limit can be raised when dilution is required due to high Dissolved Solids/Electrical Conductivity (DLDS), e.g. nitrite.

BOLD and shaded dark gray: Exceeds BCAWQG-FST (Freshwater Short Term) guideline.

Shaded Light Gray: Exceeds BCAWQG-FLT (Freshwater Long Term) guideline.

RED - Measured value is below detection limit (DL); value shown is 50% of DL

Blank - Not analyzed

Appendix B3: Right Bank Drainage Tunnel (RBDT) Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT
					21-Jan-24	27-Feb-24	19-Mar-24	28-Apr-24	23-May-24	26-May-24	2-Jul-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	23-Nov-24	20-Dec-24
Physical Parameters																	
Temperature	°C																
Flow Rate	L/sec																
Acidity (Total as $CaCO_3$)	µg/L	1000	NG	NG	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000	<2000
Alkalinity (Total as $CaCO_3$)	mg/L	1.0	NG	NG	90.8	111	113	114	111	112	196	158000	326	353	375	357	333
Electrical Conductivity (EC)	µS/cm	2.0	NG	NG	211	291	294	321	322	326	865	784	1810	2000000	2040	1740	1540
Hardness as CaCO3, dissolved	µg/L	500	NG	NG	87100	88600	83500	79200	102000	108000	96000	87100	22300	23800	22900	16400	18000
Hardness as CaCO3, from total Ca/Mg (New January 2020)	µg/L				96900	102000	108000	92700	111000	119000	97200	89300	24800	24400	22600	16800	19600
pH	pH Units	0.10	6.5 - 9.0	6.5-9.0	8.26	8.58	8.26	8.81	8.39	8.36	8.88	8.79	**9.35**	**9.45**	**9.55**	**9.76**	**9.72**
Total Dissolved Solids (TDS)	µg/L	10000	NG	NG	125000	173000	240000	240000	214000	204000	503000	456000	1090000	1170000	1140000	1050000	850000
Total Suspended Solids (TSS)	µg/L	3000	NG	NG	<3000	12400	157000	195000	7300	10000	10200	33200	<3000	18600	<3000	<3000	<3000
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	1000	NG	NG	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000	NG	NG	<1000	9500	<1000	9600	5600	6100	22800	13800	83800	112000	132000	169000	151000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000	NG	NG	90800	101000	113000	104000	105000	106000	173000	145000	242000	240000	243000	188000	182000
Anions and Nutrients																	
Ammonia (NH_4 as N)	µg/L	5.0	pH dependent (6.5-9.0)	pH dependent (6.5-9.0)	12.8	107	252	286	27.4	26.8	124	115	247	**777**	438	369	331
Ammonia FST Guideline	µg/L		pH dependent (**at Temp 4 °C** or in situ T)		3150	1610	3150	1040	2520	2520	844	1040	685	685	685	685	685
Ammonia FLT Guideline				pH dependent (**at Temp 4 °C** or in situ T)	606	310	606	201	484	484	162	201	132	132	132	132	132
Chloride (Cl^-)	µg/L	500	600000	150,000	2980	13800	14100	17600	17100	18000	124000	99900	284000	334000	348000	256000	228000
Nitrate (NO_3^- as N)	µg/L	5.0-25.0	NG	NG	93.5	120	104	102	114	118	454	451	1300	837	1420	1510	1310
Nitrite (NO_2^- as N)	µg/L	1.0-5.0	Cl-dependent (> 10,000 µg/L) Guideline: 600 ug/L	Cl-dependent (> 10,000 µg/L) Guideline: 200 ug/L	1.3	27.4	26.6	37.7	6.70	6.70	40.8	38.6	84.0	340	153	196	206
Sulphate (SO_4) [3]	µg/L	300	NG	309,000 - 429,000	15200	24500	23300	33400	26400	25500	69700	74200	134000	134000	116000	110000	97700
SO4 FLT Guideline Calc	µg/L		NG	Hardness 0-30,000 = 128,000 Hardness 30,000-76,000 = 218,000 Hardness 76,000-180,000 = 309,000 Hardness 181,000-250,000 = 429,000; Hardness > 250,000 site-specific	309000	309000	309000	309000	309000	309000	309000	309000	309000	309000	309000	309000	309000
Dissolved Organic Carbon (DOC)	mg/L		NG	NG	2.67	2.92	8.52	2.57	3.05	2.66	3.50	2.29	3.27	3.98	3.43	2.58	2.2
Metals, Total																	
Aluminum	µg/L	3.00	NG	NG	111	645	6320	3740	819	434	694	896	1020	1200	1340	1600	1500
NEW FLT Guideline (no FST) - relevant August 2023 onwards					302	402	640	414	354	316	484	376	635	711	651	583	515
Antimony	µg/L	0.10	NG	NG	0.22	0.32	0.74	0.55	0.28	0.27	0.95	1.02	1.91	2.83	2.38	2.57	2.16
Arsenic	µg/L	0.10	5.0	5.0	0.4	1.05	3.72	3.27	1.24	0.92	2.71	2.41	5.78	8.26	6.66	7.01	5.99
Barium	µg/L	0.10	NG	NG	36.1	135	265	240	69.6	60.4	96.2	99.4	113	120	122	111	102
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	0.349	0.258	<0.1	<0.1	<0.1	<0.1	<0.1	<0.100	<0.1	<0.1	<0.1
Bismuth	µg/L	0.05	NG	NG	<0.05	<0.05	0.076	0.054	<0.05	<0.05	<0.05	<0.05	<0.1	<0.100	<0.1	<0.1	<0.05
Boron	µg/L	10.0	1200	1200	<10	33	47	51	26	26	136	130	373	403	406	368	336
Cadmium	µg/L	0.005	NG	NG	0.0161	0.0206	0.0844	0.057	0.0442	0.0321	<0.045	0.104	<0.04	<0.0550	0.0201	<0.02	<0.02
Calcium	µg/L	50	NG	NG	28700	29500	31000	25600	30600	34200	26200	25200	6440	6440	5940	4470	5300
Cesium	µg/L	0.01	NG	NG	0.018	0.176	1.78	1.4	0.183	0.106	0.09	0.104	0.072	0.087	0.077	0.08	0.059
Chromium [4]	µg/L	0.1-1.0	NG	NG	<0.5	2.3	11.3	6.68	1.44	0.82	1.14	2.08	1.14	1.62	1.17	1.38	1.17
Cobalt	µg/L	0.10	110	4.0	<0.1	0.31	3.45	2.1	0.8	0.54	0.31	2.36	0.26	0.32	<0.2	<0.2	<0.1
Copper [3]	µg/L	0.50	Calc. based on Hardness	2 to 10	0.91	3.28	16.9	9.48	2.46	1.73	2.96	5.33	3.4	5.52	3.06	3.28	2.55
Cu FST Guideline Calc. - **relevant prior to August 2019**	µg/L		Hardness 13,000 - 400,000 : calc.; Hardness ≥ 400,000 is Capped Value of 400,000														
Cu FLT Guideline Calc. - **relevant prior to August 2019**	µg/L			Hardness 50,000 - 250,000: calc.; Hardness > 250,000, Cu = 10													
Iron	µg/L	10	1000	NG	76	794	**8180**	**5510**	**1310**	701	464	1970	150	177	74	81	71
Lead [3]	µg/L	0.05	101 - 348	Calc. based on Hardness	0.062	0.41	4.55	2.32	0.749	0.442	0.327	0.456	0.23	0.501	0.345	0.367	0.305
Pb FST Guideline Calc (Based on Hardness as CaCO3), applies to water hardness 8000-360,000 µg/L	µg/L		Based on Hardness 8000-360,000 Hardness ≤ 8000: 3 Hardness > 8000 : calc.		68.48	69.99	64.90	60.67	83.73	90.05	77.51	68.48	12.09	13.13	12.50	8.17	9.20
Pb FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 8000-360,000 Hardness ≤ 8000, NG Hardness > 8000 : calc.	5.98	6.04	5.84	5.68	6.58	6.82	6.33	5.98	3.78	3.82	3.80	3.63	3.67
Lithium	µg/L	1.0	NG	NG	2.3	6.5	14	12.6	7.5	7.9	39.8	36.5	89	101	97.9	84.5	79.1
Magnesium	µg/L	5.0	NG	NG	6130	6870	7460	7000	8310	8230	7730	6400	2120	2030	1890	1380	1550
Manganese [3]	µg/L	0.10	Calc. based on Hardness	Calc. based on Hardness	2.75	6.94	79.8	40.4	25.9	14.5	8.61	73	4.19	3.95	1.78	1.3	1.12
Mn FST Guideline Calc (Based on Hardness as CaCO3)	µg/L		Applies to Hardness 25000-259000 µg/L Mn : calc.		1499.8	1516.4	1460.2	1412.8	1664.0	1730.2	1597.9	1499.8	785.7	802.3	792.4	720.7	738.4
Mn FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 37000-450000 µg/L Mn : calc.	988.2	994.8	972.4	953.5	1053.8	1080.2	1027.4	988.2	703.1	709.7	705.8	677.2	684.2
Mercury (Based on methyl Hg & total mass Hg)	µg/L	0.005	NG	Calc.	<0.005	<0.005	0.0082	0.008	0.0061	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005
Molybdenum	µg/L	0.05	2000	≤ 1000	1.62	7.2	8.37	7.74	3.96	4.51	26.4	24.1	67.9	67.4	47.8	45	32.2
Nickel	µg/L	0.50	NG		0.83	3.27	9.62	5.54	2.43	1.79	1.81	6.96	1.36	1.52	1.05	<1	0.76
Phosphorus	µg/L	50.0	NG	NG	<50	<50	324	281	52	<50	55	54	<100	<100	<100	<100	81

Appendix B3: Right Bank Drainage Tunnel (RBDT) Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT
					21-Jan-24	27-Feb-24	19-Mar-24	28-Apr-24	23-May-24	26-May-24	2-Jul-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	23-Nov-24	20-Dec-24
Potassium	µg/L	50.0	NG	NG	920	1370	3340	2950	1270	1130	4100	4040	6750	7400	7030	7220	6180
Rubidium	µg/L	0.2	NG	NG	0.86	2.7	16.5	12.8	2.6	1.86	5.08	4.81	8.62	8.5	8.05	8.09	7.2
Selenium	µg/L	0.05	NG	2.0	0.368	0.54	0.803	0.719	0.483	0.514	0.9	0.751	1.21	1.53	1.55	1.31	1.2
Silicon	µg/L	100.0	NG	NG	2360	3670	12600	8220	3490	2980	3990	4280	6070	6640	7160	7390	6950
Silver [3] (Based on Hardness < or > 100000)	µg/L	0.01	0.10 - 3.0	0.05 - 1.5	0.074	0.022	0.088	0.096	0.016	0.013	0.018	0.041	<0.02	0.029	<0.02	<0.02	0.016
Ag FST Guideline Calc	µg/L		Hardness ≤ 100,000 Ag = 0.10 Hardness > 100,000 Ag = 3.0		0.10	0.10	0.10	0.10	3.00	3.00	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Ag FLT Guideline Calc	µg/L			Hardness ≤ 100,000 Ag = 0.05 Hardness > 100,000 Ag = 1.5	0.05	0.05	0.05	0.05	1.50	1.50	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Sodium	µg/L	50.0	NG	NG	5800	21700	25400	38000	25200	26400	152000	139000	379000	420000	463000	371000	324000
Strontium	µg/L	0.2	NG	NG	114	114	154	126	136	144	149	144	110	126	141	108	93.4
Sulfur	µg/L	500.0	NG	NG	5060	8220	8530	11400	9540	9310	24300	27400	47700	50300	47200	38400	33700
Tellerium	µg/L	0.2	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<0.40	<0.4	<0.4	<0.2
Thallium	µg/L	0.01	NG	NG	<0.01	0.012	0.086	0.067	0.027	0.015	<0.01	0.015	<0.02	<0.020	<0.02	<0.02	<0.01
Thorium	µg/L	0.10	NG	NG	<0.1	0.14	1.96	<1.4	0.17	<0.1	<0.1	0.1	<0.2	<0.20	<0.2	<0.2	<0.1
Tin	µg/L	0.10	NG	NG	<0.1	0.45	0.52	0.17	<0.1	<0.1	0.32	0.5	0.79	0.55	0.55	0.3	0.23
Titanium	µg/L	0.3-4.5	NG	NG	1.66	7	43.3	<22.8	14.9	7.65	7.3	9.84	1.7	2.52	2.69	2.78	2.21
Tungsten	µg/L	0.10	NG	NG	<0.1	1.96	1.88	1.17	0.28	0.32	1.92	1.74	4.26	5.72	4.75	3.58	2.76
Uranium	µg/L	0.01	NG	NG	0.49	0.632	0.97	0.843	0.609	0.586	0.728	0.714	0.565	0.751	0.64	0.602	0.56
Vanadium	µg/L	0.50	NG	NG	0.78	3.46	19	13.4	3.62	2.42	6.23	5.57	11.6	16.7	12.1	13.2	11
Zinc [3] (Based on Hardness < or > 90,000)	µg/L	3.0	Calc. based on Hardness	Calc. based on Hardness	<3	5.2	55.0	24.1	6.9	5.4	12.7	115	<6	8.0	<6	<6	3.9
Zn FST Guideline Calc. - **relevant prior to Aug 2023**	µg/L		Hardness 90,000 - 500,000, Calc. Hardness > 500,000, is Capped Value of 500,000		33.0	33.0	33.0	33.0	42.0	46.5	37.5	33	33.0	33.0	33.0	33.0	33.0
Zn FLT Guideline Calc. - **relevant prior to Aug 2023**				Hardness 90,000 - 330,000, Calc. Hardness > 330,000, is Capped Value of 330,000	7.5	7.5	7.5	7.5	16.5	21.0	12.0	7.5	7.5	7.5	7.5	7.5	7.5
Zirconium	µg/L	0.06	NG	NG	<0.2	0.25	<1	0.63	0.43	0.28	0.32	<0.6	<0.4	<0.40	<0.4	<0.4	<0.2
Metals, Dissolved																	
Aluminum [5]	µg/L	1.0	100	50	50.6	138	237	280	63	67.3	369	379	894	1130	1240	1500	1360
Al FST Guideline Calc. (based on pH); **relevant prior to Aug 2023**	µg/L		pH < 6.5 : calc. Al pH ≥ 6.5 : 100.0 Al		100	100	100	100	100	100	100	100	100	100	100	100	100
Al FLT Guideline Calc. (based on median pH); **relevant prior to Aug 2023**	µg/L			median pH < 6.5 : calc. Al median pH ≥ 6.5 : 50.0 Al	50	50	50	50	50	50	50	50	50	50	50	50	50
Antimony	µg/L	0.10	NG	NG	0.1	0.3	0.47	0.57	0.22	0.22	0.92	0.94	1.8	2.85	2.3	2.34	1.91
Arsenic	µg/L	0.10	NG	NG	0.3	0.76	1.16	1.18	0.54	0.54	2.4	1.9	5.62	8.29	6.65	6.92	6.07
Barium	µg/L	0.10	NG	NG	30.7	44.8	108	135	51.1	54.2	79.4	67.9	96	108	116	98.4	89.4
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1	<0.1	<0.1
Bismuth		0.05	NG	NG	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.250	<0.1	<0.1	<0.05
Boron	µg/L	10.0	NG	NG	<10	29	34	38	22	24	137	121	414	419	398	378	279
Cadmium [3] (Based on Hardness as $CaCO_3$)	µg/L	0.005	Calc. based on Hardness	Calc. based on hardness	0.0073	<0.01	<0.005	<0.005	0.006	<0.01	<0.015	<0.02	<0.02	0.0375	0.0213	<0.02	<0.015
Cd FST Guideline Calc.	µg/L		Hardness 7,000 - 455,000, Calc. Hardness > 455,000, is Capped Value of 455,000		0.5102	0.5193	0.4885	0.4626	0.6003	0.6367	0.5640	0.5102	0.1254	0.1341	0.1289	0.0914	0.1006
Cd FLT Guideline Calc.	µg/L			Hardness 3,400 - 285,000, Calc. Hardness > 285,000, is Capped Value of 285,000	0.1910	0.1935	0.1852	0.1781	0.2146	0.2238	0.2052	0.1910	0.0701	0.0735	0.0715	0.0559	0.0599
Calcium	µg/L	50.0	NG	NG	24600	25000	23900	22700	28700	31400	26700	23800	5670	6180	6140	4230	4790
Cesium		0.01	NG	NG	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	0.022	0.025	0.054	0.052	0.057	0.044	0.04
Chromium	µg/L	0.10	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.67	<0.5	<1	<2.50	<1	<1	0.91
Cobalt	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	0.14	0.16	<0.1	0.55	<0.2	<0.50	<0.2	<0.2	<0.1
Copper [6]	µg/L	0.20	Calc. based on BLM Model	Calc. based on BLM Model	0.56	0.71	1.09	0.46	0.76	1.02	1.37	0.88	2.25	3.55	2.40	2.58	2.00
Cu FST Guideline Value (Acute)	µg/L		BLM Ligand Model value		12.1	13.8	32.7	14.2	13.2	11.4	17.9	12.5	10.7	12.2	10.7	7.85	6.4
Cu FLT Guideline Value (Chronic)	µg/L			BLM Ligand Model value	2.06	2.36	5.53	2.42	2.27	1.96	3.09	2.15	1.75	1.99	1.75	1.27	1.03
Iron	µg/L	10.0	350	NG	<10	<10	17	11	<10	<10	22	20	<20	<500	24	25	21
Lead	µg/L	0.05	NG	NG	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.250	0.211	0.206	0.169
Lithium	µg/L	1.0	NG	NG	2	5.9	6.6	7.2	6.9	7.6	35.6	33.6	81.1	106	101	85.8	73
Magnesium	µg/L	5.0	NG	NG	6230	6350	5790	5480	7380	7160	7130	6730	1980	2040	1830	1430	1480
Manganese	µg/L	0.10	NG	NG	0.57	0.74	1.1	0.38	1.02	0.64	1.22	42.4	1.75	1.41	1.04	0.6	0.49
Mercury	µg/L	0.005	NG	NG	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005	<0.005	<0.005
Molybdenum	µg/L	0.05	NG	NG	1.4	7.13	8.45	7.72	4.03	4.18	25.4	23.9	65.5	66.6	48.8	39.5	29.6
Nickel	µg/L	0.50	NG	NG	0.65	1.14	0.75	0.53	0.88	0.79	1.08	3.32	1.06	<2.50	1.02	<1	0.65
Phosphorus	µg/L	50.0	NG	NG	<50	<50	<50	<50	<50	<50	<50	<50	<100	<250	<100	113	85
Potassium	µg/L	50.0	NG	NG	723	1340	1550	1540	1060	1140	3630	3940	6820	7880	6810	7190	6340
Rubidium	µg/L	0.20	NG	NG	0.78	1.1	1.32	1.09	1.01	1.16	4.24	4.78	8.03	8.78	8.06	7.56	6.73
Selenium	µg/L	0.05	NG	2.0	0.325	0.45	0.541	0.585	0.483	0.395	0.896	0.66	1.19	1.76	1.16	1.42	1.06
Silicon	µg/L	50.0	NG	NG	2300	2730	2960	3000	2160	2120	3060	3210	5930	6150	6390	6990	5610
Silver	µg/L	0.01	NG	NG	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.050	<0.02	<0.02	0.011
Sodium	µg/L	50.0	NG	NG	5820	22000	26000	37300	23600	25500	150000	137000	349000	440000	423000	374000	306000
Strontium	µg/L	0.20	NG	NG	103	120	117	111	132	134	143	138	106	120	133	92.2	86.4

Appendix B3: Right Bank Drainage Tunnel (RBDT) Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT-Sump	RBDT	RBDT	RBDT	RBDT	RBDT	RBDT
					21-Jan-24	27-Feb-24	19-Mar-24	28-Apr-24	23-May-24	26-May-24	2-Jul-24	21-Jul-24	28-Aug-24	25-Sep-24	27-Oct-24	23-Nov-24	20-Dec-24
Sulfur	µg/L	500	NG	NG	5380	8520	7560	10700	8540	8040	23900	24900	46300	45400	42100	36700	32000
Tellurium	µg/L	0.20	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<1	<0.4	<0.4	<0.2
Thallium	µg/L	0.01	NG	NG	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.050	<0.02	<0.02	<0.01
Thorium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.50	<0.2	<0.2	<0.1
Tin	µg/L	0.10	NG	NG	<0.1	0.35	<0.1	<0.1	<0.1	<0.1	0.28	0.32	0.71	0.58	0.5	0.25	0.18
Titanium	µg/L	0.30	NG	NG	<0.3	<0.3	0.67	<0.3	<0.3	<0.3	0.59	<0.3	<0.6	<1.50	1.09	1	1.11
Tungsten	µg/L	0.10	NG	NG	<0.1	1.64	1.38	1.88	0.33	0.34	2	1.85	4.09	5.67	4.58	3.42	2.4
Uranium	µg/L	0.01	NG	NG	0.489	0.53	0.472	0.494	0.525	0.542	0.654	0.525	0.517	0.734	0.633	0.553	0.516
Vanadium	µg/L	0.50	NG	NG	0.51	1.66	2.93	2.7	0.88	0.92	4.73	3.56	10.7	16.4	11.7	12.4	10.2
Zinc	µg/L	1.00	NG	NG	<1	<1	<1	1.1	<1	1.0	2.90	1.3	<2	<5	2.1	<2	2.3
Zn FST Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards					44.2	7.23	56.4	6.18	8.41	8.41	8.39	42.6	14.9	16.5	15.4	10.9	11.4
Zn FLT Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards					6.87	45.8	10.5	40.5	52.1	52.9	51.2	6.46	2.14	2.36	2.19	1.95	1.83
Zirconium	µg/L	0.06	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.4	<1.00	<0.4	<0.4	<0.2
Laboratory Work Order Number					FJ2400147	FJ2400509	FJ2400814	FJ2401175	FJ2401436	FJ2401445	FJ2401907	FJ2402107	FJ2402608	FJ2402937	FJ2403297	FJ2403564	FJ2403869
Laboratory Identification Number																	

Notes:

Screening completed on BCAWQG-FST [1] and FLT [2] guideline values.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2019). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture

[2] BC Ministry of Environment, Water Protection & Sustainability Branch (2018). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture

[3] Guideline is hardness dependant. Where results are above laboratory reportable detection limits, guideline limits have been evaluated based on individual sample hardness. Sample-

[4] Guideline is for Chromium (IV) cation. Analytical results are for unspeciated Chromium. Where analytical results exceed the guideline, speciated analysis may be warranted.

[5] Guideline is pH dependant.

NG - No Guideline

Detection limit can vary as described in the COA. Detection limit can be raised when dilutation is required due to high Dissolved Solids/Electrical Conductivity (DLDS), e.g. nitrite.

BOLD and shaded dark gray: Exceeds BCAWQG-FST (Freshwater Short Term) guideline.

Shaded Light Gray: Exceeds BCAWQG-FLT (Freshwater Long Term) guideline.

RED - Measured value is below detection limit (DL); value shown is 50% of DL

Blank - Not analyzed

Appendix B4 Area 21-Sump Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	Area 21-Sump 28-Apr-24	Area 21-Sump 26-May-24	Area 21-Sump 26-Jun-24	Area 21-Sump 21-Jul-24	Area 21-Sump 28-Aug-24	Area 21-Sump 25-Sep-24	Area 21-Sump 27-Oct-24
Physical Parameters											
Temperature	°C										
Flow Rate	L/sec										
Acidity (Total as $CaCO_3$)	µg/L	1000	NG	NG	<2000	<2000	3200	<2000	<2000	<2000	2800
Alkalinity (Total as $CaCO_3$)	mg/L	1.0	NG	NG	59.9	59.0	36.8	67.8	63.9	50.6	53.9
Electrical Conductivity (EC)	µS/cm	2.0	NG	NG	524	751	508	787	1060	969000	957
Hardness as CaCO3, dissolved	µg/L	500	NG	NG	218000	347000	204000	326000	447000	410000	417000
Hardness as CaCO3, from total Ca/Mg (New January 2020)	µg/L				228000	377000	218000	321000	492000	420000	450000
pH	pH Units	0.10	6.5 - 9.0	6.5-9.0	8.06	7.92	7.71	7.99	7.98	7.89	7.90
Total Dissolved Solids (TDS)	µg/L	10000	NG	NG	387000	562000	365000	577000	968000	707000	696000
Total Suspended Solids (TSS)	µg/L	3000	NG	NG	<3000	4200	6300	4400	<3000	4400	<3000
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	1000	NG	NG	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000	NG	NG	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000	NG	NG	59900	59000	36800	67800	63900	50600	53900
Anions and Nutrients											
Ammonia (NH_4 as N)	µg/L	5.0	pH dependent (6.5-9.0)	pH dependent (6.5-9.0)	19.5	11.2	10.6	7.8	15.6	59.2	51
Ammonia FST Guideline	µg/L		pH dependent (**at Temp 4 °C** or in situ T)		4950	6220	10300	6220	6220	7420	7420
Ammonia FLT Guideline				pH dependent (**at Temp 4 °C** or in situ T)	952	1430	1980	1200	1200	1430	1430
Chloride (Cl^-)	µg/L	500	600000	150,000	7170	13400	7800	15600	29800	30400	30500
Nitrate (NO_3^- as N)	µg/L	5.0-25.0	NG	NG	720	<25	231	<25	<25	467	53
Nitrite (NO_2^- as N)	µg/L	1.0-5.0	Cl-dependent (> 10,000 µg/L) Guideline: 600 ug/L	Cl-dependent (> 10,000 µg/L) Guideline: 200 ug/L	14.1	<5	5.2	<5	<5	12.5	<5
Sulphate (SO_4) [3]	µg/L	300	NG	309,000 - 429,000	185000	312000	191000	303000	454000	413000	413000
SO4 FLT Guideline Calc	µg/L		NG	Hardness 76,000-180,000 = 309,000 Hardness 181,000-250,000 = 429,000 Hardness > 250,000 site-specific	309000	429000	309000	429000	429000	429000	429000
Dissolved Organic Carbon (DOC)	mg/L		NG	NG	4.24	10.9	4.53	7.67	13	6.77	5.71
Metals, Total											
Aluminum	µg/L	3.00	NG	NG	58.4	204	288	79.4	69.2	186	105
NEW FLT Guideline (no FST) - relevant August 2023 onwards					341	589	302	481	648	430	386
Antimony	µg/L	0.10	NG	NG	1.78	3.44	1.48	4.78	5.08	1.95	2.01
Arsenic	µg/L	0.10	5.0	5.0	0.48	1.59	0.76	1.52	1.84	0.82	0.75
Barium	µg/L	0.10	NG	NG	111	178	87.9	142	134	78.1	70.7
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.100	<0.1
Bismuth	µg/L	0.05	NG	NG	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Boron	µg/L	10.0	1200	1200	23	40	40	72	90	53	53
Cadmium	µg/L	0.005	NG	NG	0.0147	<0.02	0.054	0.0095	<0.025	0.0398	0.0222
Calcium	µg/L	50	NG	NG	69200	112000	64900	99000	149000	125000	135000
Cesium	µg/L	0.01	NG	NG	<0.01	0.028	0.053	0.013	0.014	0.04	0.019
Chromium [4]	µg/L	0.1-1.0	NG	NG	3.2	4.44	4.26	3.65	1.24	0.8	0.71
Cobalt	µg/L	0.10	110	4.0	<0.1	0.19	0.74	0.16	0.11	0.29	0.1
Copper [3]	µg/L	0.50	Calc. based on Hardness	2 to 10	1.54	4.6	2.66	3.53	3.39	2.28	2.08
Cu FST Guideline Calc. - relevant prior to August 2019	µg/L		Hardness 13,000 - 400,000 : calc.; Hardness ≥ 400,000 is Capped Value of 400,000								
Cu FLT Guideline Calc. - relevant prior to August 2019	µg/L			Hardness 50,000 - 250,000: calc.; Hardness > 250,000, Cu = 10							
Iron	µg/L	10	1000	NG	20	142	369	50	55	230	119
Lead [3]	µg/L	0.05	101 - 348	Calc. based on Hardness	<0.05	0.091	0.207	<0.05	<0.05	0.124	0.064
Pb FST Guideline Calc (Based on Hardness as CaCO3), applies to water hardness 8000-360,000 µg/L	µg/L		Based on Hardness 8000-360,000 Hardness ≤ 8000: 3 Hardness > 8000 : calc.		220.2	397.9	202.3	367.5	417.0	417.0	417.0
Pb FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 8000-360,000 Hardness ≤ 8000, NG Hardness > 8000 : calc.	11.9	18.8	11.2	17.6	19.6	19.6	19.6
Lithium	µg/L	1.0	NG	NG	5.3	8.9	6.6	10.7	14.2	8.8	7.9
Magnesium	µg/L	5.0	NG	NG	13400	23700	13500	17900	29200	26300	27400
Manganese [3]	µg/L	0.10	Calc. based on Hardness	Calc. based on Hardness	3.48	8.12	17.7	6.38	2.44	10.7	3.1
Mn FST Guideline Calc (Based on Hardness as CaCO3)	µg/L		Applies to Hardness 25000-259000 µg/L Mn : calc.		2942	3394	2788	3394	3394	3394	3394
Mn FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 37000-450000 µg/L Mn : calc.	1564	2132	1503	2039	2572	2409	2440
Mercury (Based on methyl Hg & total mass Hg)	µg/L	0.005	NG	Calc.	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Molybdenum	µg/L	0.05	2000	≤ 1000	6.31	11.9	7.43	17.6	23.4	10.7	10.8
Nickel	µg/L	0.50	NG		1.43	1.88	4.78	2.63	2.61	2.6	1.91
Phosphorus	µg/L	50.0	NG	NG	<50	<50	<50	<50	<50	<50	<50
Potassium	µg/L	50.0	NG	NG	2560	4830	2430	5570	8110	5080	4820
Rubidium	µg/L	0.2	NG	NG	0.76	1.64	1.12	1.54	2.25	1.53	1.16
Selenium	µg/L	0.05	NG	2.0	3.72	6.07	4.92	6.22	5.96	4.8	3.89
Silicon	µg/L	100.0	NG	NG	2660	350	1690	1860	120	830	220
Silver [3] (Based on Hardness < or > 100000)	µg/L	0.01	0.10 - 3.0	0.05 - 1.5	<0.01	0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Ag FST Guideline Calc	µg/L		Hardness ≤ 100,000 Ag = 0.10 Hardness > 100,000 Ag = 3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0
Ag FLT Guideline Calc	µg/L			Hardness ≤ 100,000 Ag = 0.05 Hardness > 100,000 Ag = 1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Sodium	µg/L	50.0	NG	NG	11200	20400	13200	27800	38400	31400	31300
Strontium	µg/L	0.2	NG	NG	316	651	278	479	792	567	620
Sulfur	µg/L	500.0	NG	NG	62900	114000	72000	112000	164000	144000	161000
Tellerium	µg/L	0.2	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Thallium	µg/L	0.01	NG	NG	<0.01	0.014	0.01	0.012	0.01	<0.010	<0.01
Thorium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Tin	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Titanium	µg/L	0.3-4.5	NG	NG	0.6	2.73	5.03	<6.6	0.93	4.16	3.44
Tungsten	µg/L	0.10	NG	NG	0.16	0.32	0.13	0.34	0.22	0.12	0.11
Uranium	µg/L	0.01	NG	NG	1.64	2.63	0.961	1.57	2.22	1.84	1.91
Vanadium	µg/L	0.50	NG	NG	0.57	0.65	1.29	0.52	<0.5	0.84	<0.5
Zinc [3] (Based on Hardness < or > 90,000)	µg/L	3.0	Calc. based on Hardness	Calc. based on Hardness	<3	<3	6.3	<3	<3	<3.0	<3
Zn FST Guideline Calc. - relevant prior to Aug 2023	µg/L		Hardness 90,000 - 500,000, Calc. Hardness > 500,000, is Capped Value of 500,000		129	225.8	118.5	210.0	300.8	273.0	278.3
Zn FLT Guideline Calc. - relevant prior to Aug 2023				Hardness 90,000 - 330,000, Calc. Hardness > 330,000, is Capped Value of 330,000	103.5	187.5	93.0	184.5	187.5	187.5	187.5
Zircronium	µg/L	0.06	NG	NG	<0.2	0.47	<0.2	<0.2	<0.2	<0.20	<0.2
Metals, Dissolved											
Aluminum [5]	µg/L	1.0	100	50	40.6	112	29.9	45.1	39.5	19.2	20.1
Al FST Guideline Calc. (based on pH); relevant prior to Aug 2023	µg/L		pH < 6.5 : calc. Al pH ≥ 6.5 : 100.0 Al		100	100	100	100	100	100	100
Al FLT Guideline Calc. (based on median pH); relevant prior to Aug 2023	µg/L			median pH < 6.5 : calc. Al median pH ≥ 6.5 : 50.0 Al	50	50	50	50	50	50	50
Antimony	µg/L	0.10	NG	NG	1.71	3.24	1.49	4.76	4.57	2.02	1.99
Arsenic	µg/L	0.10	NG	NG	0.45	1.58	0.48	1.48	1.77	0.67	0.63
Barium	µg/L	0.10	NG	NG	101	183	80.5	149	132	76.2	67.2
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Bismuth		0.05	NG	NG	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Boron	µg/L	10.0	NG	NG	21	39	34	65	93	47	48

Appendix B4 Area 21-Sump Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	Area 21-Sump	Area 21-Sump	Area 21-Sump	Area 21-Sump	Area 21-Sump	Area 21-Sump	Area 21-Sump
					28-Apr-24	**26-May-24**	**26-Jun-24**	**21-Jul-24**	**28-Aug-24**	**25-Sep-24**	**27-Oct-24**
Cadmium [3] (Based on Hardness as $CaCO_3$)	µg/L	0.005	Calc. based on Hardness	Calc. based on hardness	0.0119	<0.015	0.0344	<0.025	0.0147	0.0284	0.017
Cd FST Guideline Calc.	µg/L		Hardness 7,000 - 455,000, Calc. Hardness > 455,000, is Capped Value of 455,000		1.31	2.12	1.23	1.99	2.75	2.52	2.56
Cd FLT Guideline Calc.				Hardness 3,400 - 285,000, Calc. Hardness > 285,000, is Capped Value of 285,000	0.38	0.46	0.36	0.46	0.46	0.46	0.46
Calcium	µg/L	50.0	NG	NG	66200	103000	60400	98800	135000	122000	128000
Cesium		0.01	NG	NG	<0.01	<0.01	<0.01	0.01	<0.01	<0.010	<0.01
Chromium	µg/L	0.10	NG	NG	3.01	4.37	3.37	3.42	1.05	0.53	0.5
Cobalt	µg/L	0.10	NG	NG	<0.1	0.13	0.43	0.11	<0.1	0.18	<0.1
Copper [6]	µg/L	0.20	Calc. based on BLM Model	Calc. based on BLM Model	1.49	4.41	1.91	3.29	3.04	1.82	1.88
Cu FST Guideline Value (Acute)	µg/L		BLM Ligand Model value		18.2	43.6	14.2	32.2	55.7	27.8	25.8
Cu FLT Guideline Value (Chronic)	µg/L			BLM Ligand Model value	3.18	7.56	2.42	5.63	9.74	4.82	4.51
Iron	µg/L	10.0	350	NG	<10	<10	<10	<10	<10	<100	<10
Lead	µg/L	0.05	NG	NG	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
Lithium	µg/L	1.0	NG	NG	5.3	8.6	5.7	9.9	13.2	8.1	8.3
Magnesium	µg/L	5.0	NG	NG	12900	21800	12800	19200	26700	25600	23600
Manganese	µg/L	0.10	NG	NG	1.78	2.17	3.63	0.99	1.53	2.36	1.18
Mercury	µg/L	0.005	NG	NG	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Molybdenum	µg/L	0.05	NG	NG	5.99	10.9	7.59	16.6	21.9	10.6	10.8
Nickel	µg/L	0.50	NG	NG	1.35	1.65	3.66	2.45	2.3	2.11	1.63
Phosphorus	µg/L	50.0	NG	NG	<50	<50	<50	<50	<50	<50	<50
Potassium	µg/L	50.0	NG	NG	2540	4870	2250	5580	8260	4940	4770
Rubidium	µg/L	0.20	NG	NG	0.74	1.49	0.62	1.59	2.17	1.16	1.07
Selenium	µg/L	0.05	NG	2.0	3.83	6.02	4.34	5.99	5.51	4.94	4.01
Silicon	µg/L	50.0	NG	NG	2600	104	1190	1780	<50	510	<50
Silver	µg/L	0.01	NG	NG	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01
Sodium	µg/L	50.0	NG	NG	11200	19700	12100	27300	36300	30100	28400
Strontium	µg/L	0.20	NG	NG	306	582	268	448	764	574	584
Sulfur	µg/L	500	NG	NG	63500	105000	71800	107000	155000	143000	135000
Tellurium	µg/L	0.20	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.2
Thallium	µg/L	0.01	NG	NG	<0.01	<0.01	<0.01	0.011	<0.01	<0.010	<0.01
Thorium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Tin	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.1
Titanium	µg/L	0.30	NG	NG	<0.3	<0.6	<0.3	<0.3	<0.3	<0.30	<0.3
Tungsten	µg/L	0.10	NG	NG	0.15	0.28	0.14	0.36	0.21	0.13	0.11
Uranium	µg/L	0.01	NG	NG	1.6	2.5	0.889	1.62	2.02	1.82	1.73
Vanadium	µg/L	0.50	NG	NG	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5
Zinc	µg/L	1.00	NG	NG	<1	1.2	2.3	1	<1	1.4	<1
Zn FST Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards					20.8	149	102	137	156	133	128
Zn FLT Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards					106	52.8	26.7	40.9	61.6	51.1	47.4
Zirconium	µg/L	0.06	NG	NG	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Laboratory Work Order Number					FJ2401175	FJ2401445	FJ2401851	FJ2402107	FJ2402608	FJ2402937	FJ2403297
Laboratory Identification Number											

Notes:

Screening completed on BCAWQG-FST [1] and FLT [2] guideline values.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2023). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2019). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2018). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp.

[3] Guideline is hardness dependant. Where results are above laboratory reportable detection limits, guideline limits have been evaluated based on individual sample hardness. Sample-specific guideline values are

[4] Guideline is for Chromium (IV) cation. Analytical results are for unspeciated Chromium. Where analytical results exceed the guideline, speciated analysis may be warranted.

[5] Guideline is pH dependant.

NG - No Guideline

Detection limit can vary as described in the COA. Detection limit can be raised when dilutation is required due to high Dissolved Solids/Electrical Conductivity (DLDS), e.g. nitrite.

BOLD and shaded dark gray: Exceeds BCAWQG-FST (Freshwater Short Term) guideline.

Shaded Light Gray: Exceeds BCAWQG-FLT (Freshwater Long Term) guideline.

RED - Measured value is below detection limit (DL); value shown is 50% of DL

Blank - Not analyzed

Appendix B5 LBDB Area Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	LBP POND	LBP POND	LBP POND	LBP POND	LBP POND
					19-Mar-24	28-Apr-24	26-May-24	26-Jun-24	21-Jul-24
Physical Parameters									
Acidity (Total as $CaCO_3$)	µg/L	1000	NG	NG	2900	7900	1000	1000	5900
Alkalinity (Total as $CaCO_3$)	mg/L	1.0	NG	NG	64.7	138	301	116	405
Electrical Conductivity (EC)	µS/cm	2.0	NG	NG	350	1720	2990	1420	3540
Hardness as CaCO3, dissolved	µg/L	500	NG	NG	118000	747000	1440000	568000	1890000
Hardness as CaCO3, from total Ca/Mg (New January 2020)	µg/L				118000	759000	1520000	588000	1820000
pH	pH Units	0.10	6.5 - 9	6.5-9.0	7.92	8.23	8.3	8.13	8.1
Total Dissolved Solids (TDS)	µg/L	10000	NG	NG	245000	1520000	2550000	1280000	3370000
Total Suspended Solids (TSS)	µg/L	3000	NG	NG	17600	9600	1500	9300	5400
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	1000	NG	NG	<1000	<1000	<1000	<1000	<1000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	1000	NG	NG	<1000	<1000	4200	<1000	<1000
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	1000	NG	NG	64700	138000	297000	116000	405000
Anions and Nutrients									
Ammonia (NH_4 as N)	µg/L	5.0	pH dependent (6.5-9.0)	pH dependent (6.5-9.0)	30.9	13.4	23.9	20.6	16.4
Ammonia FST Guideline	µg/L		pH dependent (**at Temp 4 °C** or in situ T)		7420	3950	3150	4950	4950
Ammonia FLT Guideline	µg/L			pH dependent (**at Temp 4 °C** or in situ T)	1430	759	606	952	952
Chloride (Cl^-)	µg/L	500	600000	150,000	3680	11700	13100	3600	<10000
Nitrate (NO_3^- as N)	µg/L	5.0-25.0	NG	NG	317	<50	<100	<25	<100
Nitrite (NO_2^- as N)	µg/L	1.0-5.0	Cl-dependent (> 10,000 µg/L) Guideline: 600 ug/L	Cl-dependent (> 10,000 µg/L) Guideline: 200 ug/L	15.6	<10	<20	<5	<20
Sulphate (SO_4) [3]	µg/L	300	NG	309,000 - 429,000	98800	820000	1290000	641000	2000000
SO4 FLT Guideline Calc	µg/L		NG	Hardness 76,000-180,000 = 309,000 Hardness 181,000-250,000 = 429,000 Hardness > 250,000 site-specific	309000	429000	429000	429000	429000
Dissolved Organic Carbon (DOC)	mg/L	1.0	NG	NG	12.5	14.9	22.7	14.3	22.4
Metals, Total									
Aluminum	µg/L	3.00	NG	NG	493	293	6.1	558	187
NEW FLT Guideline (no FST) - relevant August 2023 onwards				pH, DOC, Hardness-dependent; valid hardness 10-430 mg/L, pH 6.0-8.7, DOC 0.8-12.3 mg/L	633	694	707	675	669
Antimony	µg/L	0.10	NG	NG	0.18	<0.1	<0.2	0.24	<0.2
Arsenic	µg/L	0.10	5, discontinued Aug 2023	5.0	1.54	0.79	0.6	0.7	0.73
Barium	µg/L	0.10	NG	NG	66.3	27.4	23	64.3	37.2
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	µg/L	0.05	NG	NG	<0.05	<0.05	<0.1	<0.05	<0.1
Boron	µg/L	10.0	1200	1200	29	132	189	121	260
Cadmium	µg/L	0.005	NG	NG	0.108	0.0258	<0.01	0.643	0.0287
Calcium	µg/L	50	NG	NG	32600	175000	304000	144000	374000
Cesium	µg/L	0.01	NG	NG	0.112	0.036	<0.02	0.046	0.038
Chromium [4]	µg/L	0.1-1.0	NG	NG	0.95	<0.5	<1	0.78	<1
Cobalt	µg/L	0.10	110	4.0	0.65	4.79	0.64	3.82	0.92
Copper [3]	µg/L	0.50	Calc. based on Hardness	2 to 10	4.45	1.39	<1	3.52	<1
Cu FST Guideline Calc. - relevant prior to August 2019	µg/L		Hardness 13,000 - 400,000 : calc.; Hardness ≥ 400,000 is Capped Value of 400,000						
Cu FLT Guideline Calc. - relevant prior to August 2019	µg/L			Hardness 50,000 - 250,000: calc.; Hardness > 250,000, Cu = 10					
Iron	µg/L	10	1000	NG	**1320**	**1030**	330	475	448
Lead [3]	µg/L	0.05	101 - 348	Calc. based on Hardness	1.04	0.203	<0.1	0.282	0.124
Pb FST Guideline Calc (Based on Hardness as CaCO3), applies to water hardness 8000-360,000 µg/L	µg/L		Based on Hardness 8000-360,000 Hardness ≤ 8000: 3 Hardness > 8000 : calc.		100.8	417.0	417.0	417.0	417.0
Pb FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 8000-360,000 Hardness ≤ 8000, NG Hardness > 8000 : calc.	7.2	19.6	19.6	19.6	19.6
Lithium	µg/L	1.0	NG	NG	8.2	22.7	38.4	37.8	70.3
Magnesium	µg/L	5.0	NG	NG	8990	78200	184000	55500	216000
Manganese [3]	µg/L	0.10	Calc. based on Hardness	Calc. based on Hardness	72.5	1330	332	184	576
Mn FST Guideline Calc (Based on Hardness as CaCO3)	µg/L		Applies to Hardness 25000-259000 µg/L Mn : calc.		1840	3394	3394	3394	3394
Mn FLT Guideline Calc (Based on Hardness as CaCO3)	µg/L			Applies to Hardness 37000-450000 µg/L Mn : calc.	1124	2585	2585	2585	2585
Mercury (Based on methyl Hg & total mass Hg)	µg/L	0.005	NG	Calc.	0.0073	<0.005	<0.005	0.005	<0.005
Molybdenum	µg/L	0.05	2000	≤ 1000	2.01	0.961	0.637	2.03	0.778
Nickel	µg/L	0.50	NG		4.44	22.4	9.99	26.9	10.6
Phosphorus	µg/L	50.0	NG	NG	384	80	<100	85	<100
Potassium	µg/L	50.0	NG	NG	10100	17000	19800	9160	10500
Rubidium	µg/L	0.2	NG	NG	2.58	3.48	5.26	2.89	3.68
Selenium	µg/L	0.05	NG	2.0	0.593	0.365	0.28	0.944	0.299
Silicon	µg/L	100.0	NG	NG	2750	1410	<200	4680	4640
Silver [3] (Based on Hardness < or > 100000)	µg/L	0.01	0.10 - 3.0	0.05 - 1.5	0.023	<0.01	<0.02	0.015	<0.02
Ag FST Guideline Calc	µg/L		Hardness ≤ 100,000 Ag = 0.10 Hardness > 100,000 Ag = 3.0		3.0	3.0	3.0	3.0	3.0
Ag FLT Guideline Calc	µg/L			Hardness ≤ 100,000 Ag = 0.05 Hardness > 100,000 Ag = 1.5	1.5	1.5	1.5	1.5	1.5
Sodium	µg/L	50.0	NG	NG	8290	96900	242000	90200	281000
Strontium	µg/L	0.2	NG	NG	115	433	756	383	982
Sulfur	µg/L	500.0	NG	NG	30300	304000	600000	244000	722000
Tellerium	µg/L	0.2	NG	NG	<0.2	<0.2	<0.4	<0.2	<0.4
Thallium	µg/L	0.01	NG	NG	0.026	0.012	<0.02	0.022	<0.02
Thorium	µg/L	0.10	NG	NG	<0.2	<0.1	<0.2	<0.2	<0.2
Tin	µg/L	0.10	NG	NG	<0.1	<0.1	<0.2	<0.1	<0.2
Titanium	µg/L	0.3-4.5	NG	NG	6.69	<9.3	<0.6	10.6	<2.4
Tungsten	µg/L	0.10	NG	NG	<0.1	<0.1	<0.2	<0.1	<0.2
Uranium	µg/L	0.01	NG	NG	0.637	1.57	2.91	1.34	7.1
Vanadium	µg/L	0.50	NG	NG	2.14	0.95	<1	1.33	<1
Zinc [3] (Based on Hardness < or > 90,000)	µg/L	3.0	Calc. based on Hardness	Calc. based on Hardness	46.5	17.2	<6	209	14.1
Zn FST Guideline Calc. - relevant prior to Aug 2023	µg/L		Hardness 90,000 - 500,000, Calc. Hardness > 500,000, is Capped Value of 500,000		54.0	340.5	340.5	340.5	340.5
Zn FLT Guideline Calc. - relevant prior to Aug 2023	µg/L			Hardness 90,000 - 330,000, Calc. Hardness > 330,000, is Capped Value of 330,000	28.5	187.5	187.5	187.5	187.5
Zirconium	µg/L	0.06	NG	NG	<0.2	0.22	<0.4	<0.6	<0.4
Metals, Dissolved									
Aluminum [5]	µg/L	1.0	100	50	34.5	5	4.1	62.4	4.8
Al FST Guideline Calc. (based on pH); relevant prior to Aug 2023	µg/L		pH < 6.5 : calc. Al pH ≥ 6.5 : 100.0 Al		100	100	100	100	100
Al FLT Guideline Calc. (based on median pH); relevant prior to Aug 2023	µg/L			median pH < 6.5 : calc. Al median pH ≥ 6.5 : 50.0 Al	50	50	50	50	50
Antimony	µg/L	0.10	NG	NG	0.12	<0.1	<0.2	0.22	<0.2
Arsenic	µg/L	0.10	NG	NG	0.66	0.5	0.61	0.38	0.52

Appendix B5 LBDB Area Water Analytical Results

Parameter	Unit	RDL	BCAWQG - FST 1	BCAWQG - FLT 2	LBP POND	LBP POND	LBP POND	LBP POND	LBP POND
					19-Mar-24	28-Apr-24	26-May-24	26-Jun-24	21-Jul-24
Barium	µg/L	0.10	NG	NG	33.7	21.3	23.4	51.2	34.8
Beryllium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth		0.05	NG	NG	<0.05	<0.05	<0.1	<0.05	<0.1
Boron	µg/L	10.0	NG	NG	27	118	202	106	254
Cadmium [3] (Based on Hardness as $CaCO_3$)	µg/L	0.005	Calc. based on Hardness	Calc. based on hardness	0.0632	0.0144	<0.01	0.604	0.0164
Cd FST Guideline Calc.	µg/L		Hardness 7,000 - 455,000, Calc. Hardness > 455,000, is Capped Value of 455,000		0.70	2.80	2.80	2.80	2.80
Cd FLT Guideline Calc.	µg/L			Hardness 3,400 - 285,000, Calc. Hardness > 285,000, is Capped Value of 285,000	0.24	0.46	0.46	0.46	0.46
Calcium	µg/L	50.0	NG	NG	33200	174000	305000	137000	383000
Cesium	µg/L	0.01	NG	NG	<0.01	<0.01	<0.02	<0.01	<0.02
Chromium	µg/L	0.10	NG	NG	<0.5	<0.5	<1	<0.5	<1
Cobalt	µg/L	0.10	NG	NG	0.3	3.83	0.61	3.4	0.53
Copper [6]	µg/L	0.20	Calc. based on BLM Model	Calc. based on BLM Model	2.83	1.19	0.61	2.84	0.46
Cu FST Guideline Value (Acute)	µg/L		BLM Ligand Model value		39.1	73.7	104	66.7	91.8
Cu FLT Guideline Value (Chronic)	µg/L			BLM Ligand Model value	6.64	13.1	18.6	11.7	16.2
Iron	µg/L	10.0	350	NG	71	31	75	18	42
Lead	µg/L	0.05	NG	NG	0.066	<0.05	<0.1	<0.05	<0.1
Lithium	µg/L	1.0	NG	NG	7.7	22.2	43.1	35.2	69.1
Magnesium	µg/L	5.0	NG	NG	8520	76000	164000	55000	226000
Manganese	µg/L	0.10	NG	NG	56	1170	336	166	615
Mercury	µg/L	0.005	NG	NG	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	µg/L	0.05	NG	NG	1.63	0.898	0.655	2.03	0.762
Nickel	µg/L	0.50	NG	NG	2.9	20.2	9.9	24.7	10.5
Phosphorus	µg/L	50.0	NG	NG	206	<50	<100	<50	<100
Potassium	µg/L	50.0	NG	NG	9470	16800	19800	8810	9860
Rubidium	µg/L	0.20	NG	NG	1.44	3.07	5.8	2.36	3.55
Selenium	µg/L	0.05	NG	2.0	0.51	0.296	0.34	0.841	0.266
Silicon	µg/L	50.0	NG	NG	1920	725	<100	4030	4440
Silver	µg/L	0.01	NG	NG	<0.01	<0.01	<0.02	<0.01	<0.02
Sodium	µg/L	50.0	NG	NG	8080	97800	229000	83600	273000
Strontium	µg/L	0.20	NG	NG	107	412	734	382	914
Sulfur	µg/L	500	NG	NG	28000	295000	541000	253000	709000
Tellurium	µg/L	0.20	NG	NG	<0.2	<0.2	<0.4	<0.2	<0.4
Thallium	µg/L	0.01	NG	NG	<0.01	<0.01	<0.02	0.017	<0.02
Thorium	µg/L	0.10	NG	NG	<0.1	<0.1	<0.2	<0.1	<0.2
Tin	µg/L	0.10	NG	NG	<0.1	<0.1	<0.2	<0.1	<0.2
Titanium	µg/L	0.30	NG	NG	4.56	<0.3	<0.6	0.6	<0.6
Tungsten	µg/L	0.10	NG	NG	<0.1	<0.1	<0.2	<0.1	<0.2
Uranium	µg/L	0.01	NG	NG	0.49	1.48	2.96	1.27	7.22
Vanadium	µg/L	0.50	NG	NG	<0.5	<0.5	<1	<0.5	<1
Zinc	µg/L	1.00	NG	NG	35.9	9.7	2.2	**175**	7.8
Zn FST Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L		Hardness and DOC-dependent, Capped Value; valid for Hardness 13.8-250.5 mg CaCO3/L, DOC 0.3-17.3 mg/L		82.5	57.5	68.3	160	167
Zn FLT Guideline Calc. - NEW GUIDELINE relevant Aug 2023 onwards	µg/L			Hardness and DOC-dependent, Capped Value; valid for Hardness 23.4-399 mg $CaCO_3$/L, pH 6.5-8.13, DOC 0.3-22.9 mg/L)	20.1	161	167	56.6	69.4
Zirconium	µg/L	0.06	NG	NG	0.32	<0.2	<0.4	<0.2	<0.4
Laboratory Work Order Number					FJ2400814	FJ2401175	FJ2401445	FJ2401851	FJ2402107

Notes:

Screening completed on BCAWQG-FST [1] and FLT [2] guideline values.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2023). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2019). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Short Term Maximum (ST) guidelines.

[1] BC Ministry of Environment, Water Protection & Sustainability Branch (2018). British Columbia Approved Water Quality Guidelines (BCAWQG): Aquatic Life, Wildlife & Agriculture Summary Report. 36 pp. Referenced for Freshwater Aquatic Life (F) water use and Long Term Average (LT) guidelines.

[3] Guideline is hardness dependant. Where results are above laboratory reportable detection limits, guideline limits have been evaluated based on individual sample hardness. Sample-specific guideline values are listed in parentheses after the laboratory result, where applicable.

[4] Guideline is for Chromium (IV) cation. Analytical results are for unspeciated Chromium. Where analytical results exceed the guideline, speciated analysis may be warranted.

[5] Guideline is pH dependant.

NG - No Guideline

Detection limit can vary as described in the COA. Detection limit can be raised when dilution is required due to high Dissolved Solids/Electrical Conductivity (DLDS), e.g. nitrite.

BOLD and shaded dark gray: Exceeds BCAWQG-FST (Freshwater Short Term) guideline.

Shaded Light Gray: Exceeds BCAWQG-FLT (Freshwater Long Term) guideline.

RED - Measured value is below detection limit (DL); value shown is 50% of DL

Blank - Not analyzed